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The Natural Education Series

NEW METHODS *in* EDUCATION

BOOKS III & IV

Modelling with Design

By J. LIBERTY TADD

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Philadelphia, Pa., U. S. A*

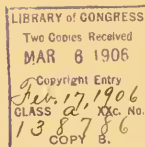
With a Wealth of Illustration

AUSTRALIAN EDITION

With Introduction by JOHN BRANCH, Superintendent
of Drawing, Department of Public
Instruction,
New South Wales

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Introduction

This volume contains two of the five Books which form the whole of J. Liberty Tadd's "New Methods in Education"—a work so well known that it is unnecessary to praise it here.

The course of study in Modelling prescribed for the Teachers of New South Wales under the Department of Public Instruction comprises

"Modelling from Nature and Objects, with Design in high or low relief."

The first part of this volume consists of a book on Modelling, describing methods and suggesting subjects for study; the second part is a book on Woodcarving, which has been included, not that the student is expected to learn to carve, but that he may obtain some knowledge of modelled design. The majority of relief ornament is carried out in either wood or stone. Of course ornament in relief can also be applied to metal,—by casting, beating, or by electrotype process,—to leather and to almost any substance. But as stone, wood, and metal are the substances most commonly ornamented in relief, and as, even for cast metal, the design is first carved in wood, the chapters on these processes will be found useful in the study of design. *•

. The student should study thoroughly the Modelling here given; working from Nature or from objects which he can readily obtain; and basing his designs upon the forms thus learnt, always endeavouring to understand the limitations imposed upon him by the material in which his design is intended to take permanent form, whether it be wood,—in which case undercutting can be allowed to any extent,—or stone, which should have much less, if any, undercutting; or, again, beaten metal work (*repousse*), which should have none. In *ceramics*, designs in high and low relief, or in the round, can be carried out.

If the student should be tempted to take up woodcarving as a

hobby, he or she will find it a most fascinating occupation, a powerful antidote to the mental weariness caused by the absorbing work of the day, and one of the best forms of rest—change of work. Again, if the student can continue till he has a certain amount of dexterity, he will be able to carve parts of household furniture,—picture frames; tops of chairs; lids, fronts and sides of boxes; panels of doors; the lintel of his fireplace, and such small things as watch stands, bread boards, teapot stands, butter dish stands, etc. These should all bear original designs, and be suited for their purposes. If well designed and well carried out, they will be a source of permanent pleasure,

“A thing of beauty is a joy forever.”

The Modeller deals with planes. His object is to obtain planes similar, or relatively similar, to those of the surface of the object or specimen from which he is working. The planes will be seen by the light which they catch, and the shapes and density of the shadows which they cast. This “light and shade” should be the same as that caught and thrown by the real thing when placed in the same position, if the modeller is working in the same relief, and relatively similar if working in a lower relief. In the formation of a design, after the disposition of the masses and spaces, next in importance is the harmony of light and shade produced. This, of course, the modeller creates.

A blind person can judge modelling, and even in the case of persons with good eyesight the most delicate modelling can better be felt than seen. If ever the student is tempted to put a scratch for the vein or rib in a leaf, let him subject it to the test of touch.

The student should always work for the large masses and planes first, then those next in importance, and last of all he should attend, if necessary, to the texture of the surface. Modelling should consist mainly in building up, continually adding, and hardly ever cutting away. Carving is just the reverse: the material is continually being cut away.

This book ably deals with some of the reasons for teaching modelling, but I think the time has now come when its power to convey or fix impressions during other lessons should be recognised as of great value in the Primary Schools. Alone, it is a potent means of education; but when applied to the study of other subjects, in the hands of an able Teacher it is an instrument of unique value. Most Teachers in these days allow their scholars to assimilate their Nature Knowledge through their tactual sense, by modelling. If it were only that an extra sense is brought to bear upon the subject, there would be a distinct gain in the amount, kind, quality and permanency of the knowledge so obtained; but

it is not only the use of the extra sense, it is the employment of that particular sense which conveys the truest impressions to the brain. A pupil can get through some other lessons without paying more attention than he cares to give; but in Modelling his observation is compelled—he *must* think and act for himself.

Whether the pupil be modelling a relief map or the parts of a blossom, his mind must be in his work; he is making an investigation, he is obtaining direct impressions. His impressions are being amassed through *several* senses, instead of through the sense of hearing alone as under ancient methods. Thus his knowledge becomes more definite and permanent, and he is developing a sense and faculties which previously were allowed to lie dormant.

Modelling in the study of Nature has been mentioned, but the teaching of other subjects can also be greatly facilitated by this means,—e. g., Mathematics, at almost every stage from the difference between 1 unit and 1 ten to sections in solid geometry.

But, in order to obtain the greatest benefit from his modelling in other lessons, it is necessary that the pupil should understand a good process and the best methods for the work he has to do; and for this purpose a course in Modelling should be framed, which should be graded, varied, and interesting. Such a course (while always keeping in view that the mental process involved in obtaining an accurate impression and compelling the hand to obey and express accurately that impression is of the first importance) should also be designed to teach a certain amount of technique.

The natural specimens should be chosen from the neighboring flora, and opportunities can be made for imparting some useful knowledge of the specimen. In grading the lessons the Teacher should commence with lance-shaped leaves, such as the Moreton Bay fig; then proceed to cordate leaves as the violet, to trefoils as the oxalis; then on to the oak, coral, three-pointed ivy, five-pointed ivy; and, for the sake of variety, he should intersperse blossoms,—four-petaled, five-petaled, simple and more complex. Designs, based on forms already learnt, should also be required occasionally, and if the school is in the vicinity of a factory, perhaps a pottery, where designs in relief or designs of shapes are of commercial value, the Teacher would do well to make a special study of these local requirements, and an endeavour should be made to use the native plants in the formation of such designs.

Every design, if pleasing, will be found to embody some of the following elementary principles of ornament, which the Teacher should un-

derstand, but which the scholar should be allowed to discover for himself.

Repetition The accurate reproduction of a unit or units already formed, and the accurate placing of these units in similar positions.

Symmetry Making the right-hand half of a figure exactly the reverse of the left-hand side. This will include, not only the shapes of the masses, but the inclinations of the various planes.

Balance Having the masses balanced, but not necessarily symmetrical. Heavy masses on one side of an upright stem, and insufficient mass on the other side, would show want of balance.

Subordination This principle applies to the sizes of the masses, to the amount of detail in those masses, to their positions and treatment for the purpose of the design, and in many other ways. Examples of subordination of parts can be studied from Nature. Take a rose leaf of five leaflets, the end leaflet will be the largest, the next pair of leaflets will be medium-sized, and the final pair will be the smallest. Look at the tips of an ivy leaf; the end tip has the finest curves, and the best arrangement of plane, the next pair are not so elaborate, and the tips nearest to the petiole will have very simple curves and planes.

So in the formation of a design, the best or most beautiful piece should be placed in the most important position, the other pieces all in due gradation.

Radiation Lines or masses growing from the same point or line suggesting a common origin: the masses or lines need not, of course, come away from the line at right angles, but should suggest growth. Radiation of masses can be seen in the marguerite blossom, the pepper leaf, palms, leaves from the root of the freesia, parts of some shells, and in countless other objects.

Repose A steady and dignified treatment as opposed to the misplacement of small masses or details which would catch high lights and cast strong shadows, asserting themselves at the expense of the main portions. Too many similar curves radiating from one place or having the appearance of motion, unless sufficient contrast were provided, would also suggest want of repose.

Contrast A very valuable item in any design: the beauties of one form are contrasted with those of another and all are enhanced. Masses are contrasted with spaces (almost as important in design as masses), lines with masses, light with shade, etc.

Unity The co-operation of every piece in a design to produce some desired effect.

Even if a design embodies every principle here mentioned, and

Introduction

many more, and yet is unfitted for its purpose, the result will not be a success. A table top might have a certain amount of carving and yet objects might stand upon it,—for instance, the table might be ornamented with a border, small spaces being removed to a very slight depth, and parts of the original surface left to complete the pattern. If, however, the table top were carved all over in high relief, the design might be excellent in itself, but the table would be spoiled.

It frequently happens that a student spoils his design by working after a certain stage; he is probably paying attention to the details, bringing them into prominence at the expense of the main portions,—losing *breadth*.

Microscopic detail in design intended for stone-carving, to be placed outside at a height of twenty feet, would be wasted, so in every case the student should keep in mind, not only the purpose for which the design is intended, but also the position from which it will be seen.

The student should practise working “in the round,”—making and modelling all sides, in “high relief,” modelling the front and sides only, as the work will in this case be viewed from the front, and should also practise in “low relief,” the most difficult of all, in many cases. In dealing with high relief the light and shade produced might be the actual light and shade of the specimen, but in low relief the highest light will probably be less in intensity and the deepest shadow will be not nearly so deep as seen on the specimen, yet there should be, if possible, the same range of tones between;—compare the low relief head on a medal or coin with a bust of the same “in the round.” Low relief should be less than half the real relief.

The ornamentation of an object is not the only scope for invention in modelling. Shapes of vases, jugs and other utensils can be designed. The student should not lightly conclude that the formation of any object is perfect. Even an egg-cup can be improved.

A form, as soon as it is applied as an ornament, ceases to be a picture of Nature and becomes, instead, an item in a scheme of decoration. Each item then should be so treated that it will produce the best effects. It will be noticed that symmetry is never truly found in Nature, but symmetry is one of the most beautiful properties in ornament, and it is ornament we shall be dealing with in most designs; therefore one liberty the designer can take with the natural specimen when adapting it to ornament is to make symmetrical what seems to have desired to grow symmetrically. Generally speaking, he should take the beauties of form, growth, etc., and make the most of them, omitting accidentals. The

scholar will generally *simplify*. This conventionalization should not be carried so far that all trace of the plant from which the ideas were obtained is lost. Neither is it good form to supply a five-petaled blossom with six petals, nor to show stalks growing from stems if they should grow from the root. Learn Nature thoroughly; then adapt her for the purpose required.

When modelling a relief map the surface of the modelling board or modelling slate may represent the sea-level. The land can be built from the highest portions to the coast (attending to the coast line last), or the coast line can be drawn in the usual way, and modelling material filled in to represent land. By the use of both methods, fresh ideas will be gained in each case. Care should be taken that the scholar does not make his coast line one continuous cliff shore, as the land generally runs gradually into the sea. Usually the heights should be built to a much larger scale than that employed for the area, and if a mountain of 2,000 feet is represented as half an inch in height, the scholar should be careful to make his 1,000 feet mountain a quarter of an inch in height. These may be measured by means of a pin run through the summit to the slate, representing sea-level. Cotton can be used for rivers, and beads to indicate the position of towns. A plaster cast can very easily be made of a map by following the method given at the end of the chapters on modelling, as there will be no undercutting.

The student should carefully read this volume and endeavour to master the spirit of it. The best objects obtainable should be used in attempting the work here described, which, however, does not profess to embrace a graduated course of instruction. After the student has mastered a certain amount of technique he should go straight to Nature. If unable to procure casts of animals, birds, or fish; he can probably find a stuffed specimen, which will be far better; if that is impossible, he should neglect animal forms and pay more attention to objects and design. This book furnishes methods and presents the work in its educative form. The enthusiasm displayed by its author will most assuredly affect the student if he goes to work in the manner advised; and in the school the study will become a keen artistic pleasure alike to scholar and Teacher.

A further note on design, and an additional suggestion upon Modelling, will be found on the last two pages of this edition.

JOHN BRANCH,

Superintendent of Drawing to the Department of
Public Instruction, Sydney, New South Wales.

Another Note on Design

BY JOHN BRANCH

As far as design is concerned the tendency in the present day is towards originality. The world seems to be tiring of the attempts at original arrangements of the lotus, anthemion, acanthus and the rest, and is demanding fresh work through fresh minds from fresh themes. Nature in Australia supplies an infinity of beautiful, new shapes and ideas if we will only look—not even *for* them, but simply *at* them. They are under our feet, staring at us from the scrub, or, like the eucalyptus, hanging down towards us from the skies. A handful of boronia from one plant, perhaps growing by the gate, will supply a class with material for lessons in modelling, line-drawing and brush-work, botany and designing. Families of heaths, epacris (native fuchsia), boronias, grasses suitable for modelling, are heedlessly trampled upon every day by children going to school. The waratah, five-corner, geebung, eriotemon, flannel flower, banksia, wattle, tecoma, and hundreds of other handsome “bush flowers” are waiting to assist in the development of a truly Australian ornament. Their beauty and novelty are a perpetual invitation to the modeller in quest of new and graceful designs. Even if nothing can be done in original design, by modelling in the school from the flora of the neighbourhood the Teacher can interest the scholars in the great and wonderful “bush.” In agricultural districts, wheat, oats, barley, maize and edible roots will supply forms for modelling and food for thought. The scholar should first learn Nature as it lies around him before he is introduced to the wonders of districts which he cannot reach, but far-off fields should not be entirely neglected. It should not be taken for granted that the scholar, because he lives in the midst of a sugar plantation, knows the form of the sugar cane. It is commonplace to him, no doubt, but so is his spoon, and perhaps he cannot model even the spoon. The scholar should be taught to *see* and *know* the things at which he looks, and the teacher should constantly keep in mind that the value of designing lies in the *mental processes involved* in the originating and creating of a piece of work conceived in the child's mind.

A Note on Modelling by Mr. Branch

Plaster
Cast

At the end of the chapters on Modelling will be found directions for making a plaster cast from a plaster mould. Here is another recipe which will be of service when there is much undercutting in the modelling:—

Mix carefully and slowly by heating one part of beeswax with about one and one-half parts of powdered resin. While this is dissolving build a wall of modelling material around the work. When the wax composition is thoroughly mixed and partly cooled again, pour some of it over the work, but only sufficient to form a complete, thick skin. When this has set, fill in the undercut parts carefully with clay and when there is no more undercutting, wash over with clay water and pour in plaster to give strength to this mould. When the plaster has set turn it over and remove the modelling. Clean and oil the wax mould, build another wall of clay around the edge of this mould, pour in the plaster for the cast, insert two pieces of bent wire by which to hang it, and when set, turn this plaster down. The advantage of this mould will now be seen. Lift off the plaster support of the mould. Withdraw the pieces of clay from the undercut portions and strip off the wax, if necessary warming the wax in hot water before removing.

Treatment
of a
Plaster Cast

If desired coloured, soak the cast in water first and then when quite damp apply water colour, or while the cast is still damp apply dry powdered colour.

Material
for
Modelling

For school work on a small scale, when one lesson a week is given, some of the modern ever-plastic substances will be found more useful than either clay or modelling wax, but great care should be exercised in the choice, as material which will decompose would be dangerous in the school. Germ-proof material should be obtained. Ordinary putty may be useful for modelling relief maps if they are required for preservation.

BOOK THREE

Modeling



Clay models of real fish made by
grammar grade pupils



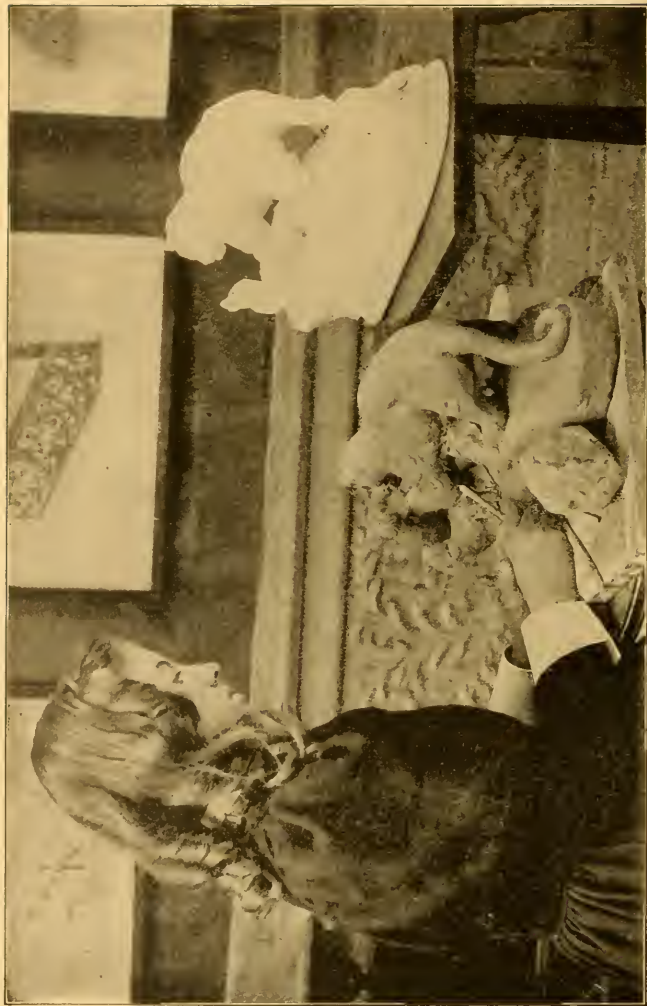
"Perception and memory should be indissolubly associated. Two errors—to expect a child to remember what it has never perceived, and to allow it to perceive without any systematic representation of the object in memory." [Jacobi.

"Good thoughts are no better than good dreams unless they be executed."—[Emerson.

"Without action, thought can never ripen into truth."—[Emerson.



Wood Carving by School Boy



Modeling Animal Forms

This pupil is modeling one of the Barry tigers. These animal forms are especially attractive to children. Being very broadly modeled, they are able to reproduce some of the animals with great fidelity. Animal heads are also good for children to model.

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Plaster Model
For drawing, modeling and carving.

CHAPTER I

Introduction, Plant, Etc.*

THERE IS ONLY ONE WAY TO KNOW FORM—that is by making it, not simply drawing it. If we are to know things as they actually are, and at the same time to cultivate an energetic disposition to perform deeds, then modeling, clay modeling, must become a part of educational work. The greatest artists have been the men who have been able to model, like Michael Angelo, Donatello, Cellini, Leonardo da Vinci, Leighton, Gerome and others. All sculptors have to know form, because they have to make it. There are many artists who know form but slightly, and that is the reason some of them fail in their work.

In many art schools modeling is now advocated as a means of teaching form, even for painters, engravers and illustrators, for one may draw the shape of an object many times, and still not be familiar with its appearance all around. This is not the case in modeling, for in this you have to make it all around and touch it all over. A vivid impression is gained through

* All the modeled work in the illustrations, and the tiles inserted in the text, have been modeled by the children of the various grades.

the sense of touch and the muscular sense. I have continually spoken of drawing as a mode of thought-expression. In like manner modeling in clay is a mode of expression, only a more thorough mode than any other.

Modeling compels the use of both hands continually. The more we use our hands the more control we have over those organs, and the more vital we make the connection between the hands and the brain. In modeling we use several channels of impression, the sight, the touch, and the muscular sense. All sculptors get a wonderful sense of form through feeling or touch; the most beautiful curves and the most delicate portions of some statues being made by the fingers alone. All bronze and marble statues are first modeled in clay, and then cut in marble or cast in bronze. The actual thought of the artist, the real manipulative work, is always impressed on this plastic medium, that responds to the slightest touch. It is this wonderful "feeling" that enables the sculptor mentally to grasp almost imperceptible variations and gradations of form that are invisible to the ordinary vision. This seeing-power, as it may be called, is partly the result of the tactual impressions on the mind. Touch has been considered by some to be the master sense, one of the first developed, and few realize its importance as a means of training the mind and the judgment. A great part of the knowledge attributed to the sense of sight is received through the touch alone.

In these chapters on modeling I have purposely refrained from grading the work too closely. The elementary forms suggested for little children are just as good for adult teachers or others, if they have never handled clay. The exercises on manipulation of course cannot be attempted by very young pupils. The following lessons may be taken in any order desired, and are chiefly intended to indicate the variety of things that can be made and one way of making them. The lessons are the result of experience with large numbers, and the forms given are some of the best for class purposes.

The Plant Required for modeling is inexpensive. A board 12x14 and about one inch thick, a palette knife to cut and smooth the clay, one or two modeling tools for each pupil, and one or two cups for water for a class are all that is required. Clay can be purchased at any pottery or brick-yard. If it is not convenient to get it at these places, it can be purchased through any art-material store. It should not cost more than a cent and a half a pound, although some dealers charge from three to five cents a pound.

PLATE FOURTEEN



180 Small Forms Modeled in Clay, Suitable for Young Children

Many of the forms were made by the pupils without suggestion. The flat tiles are made, and various simple patterns are drawn and stamped upon them. The forms are not arranged in any special order, but the simplest are the balls and arrangements, next the tiles and rolls made into arrangements, next the geometric and fruit forms. Sixteen life forms are in the series, and all the forms have been made many times by very young pupils. The forms are taken from a large number made by my private pupils, and are suggestive to teachers of modeling. In many schools the geometric forms are modeled too frequently, with perhaps a potato or an apple by way of variety. Children will never tire of the work if they have a chance to vary forms.

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It can be purchased in quantity at any pottery for about \$20 a ton. This clay, used in making pottery, is very fine, clean, sifted and screened, and is the kind used by sculptors. Clay in some localities is gray, in others red or yellow or blue. The gray clay is the best, but good work can be done with the red, blue or yellow. If possible, however, procure the ordinary gray clay.

Good clay is one of the cleanest mediums of which we have any knowledge. It is antiseptic. If disease germs are placed in the clay and it is allowed to remain in the sunlight to dry, the germs become devitalized.* It brushes from the clothing with a very few touches, and if the pupils are not allowed to scatter it on the floor, when the modeling boards are put away no one need know that clay has been used. The children should be allowed to wash their hands after using it. Like flour in mixing dough, it has a tendency to make the hands feel a little dry in the beginning. This soon passes away.

Many teachers object to the use of clay in schools because they say "it makes a mess." Only in the hands of an ignorant teacher can it do so. No one should attempt to teach clay work who is unable to model. The clay must be in good condition every time it is given to the children. Only an expert, one accustomed to model, can tell when the clay is in good condition. It must not be too hard, it must not be too soft, it must not be rotten, it must be just right. This can be "felt" only by one who himself models. In this series of lessons I propose to illustrate, by means of a few exercises, the manipulation and care of clay, the use of tools and appliances, and then the making of a series of easy, simple elementary forms suited for the very youngest children in primary schools, the exercises increasing in difficulty up to the ordinary work of the grammar grades.

Teachers must not give these series of forms to the children one after

*The following is an extract from the report of the committee of hygiene of the Philadelphia board of public education as to the value of clay modeling, made in 1895:

"Your committee would urge as a matter pertaining to the health of the children attending our public schools, the most extended introduction possible of the present system of clay modeling, believing that such manual training is in every respect valuable and likely to be followed by the best results to mind and body. As the Director of the Public School of Industrial Art has said, 'No medium better than clay will ever be devised to fulfill the plastic requirements of educational thought-expression, as is witnessed by its universal use in the arts and industries of all nations since the beginning of history.'

"(Signed) Alexander H. McAdam, M. D., Chairman.

"(Signed) Thomas G. Morton, M. D.

"(Signed) William K. Mattern, M. D."

the other in quick succession. Many of the shapes need to be made a number of times, and others of like nature should be given. The series are taken from a variety of forms used in my classes, and with some classes of normal pupils the entire number can be made in a few weeks. Teachers must not cease to remember that the children have several years to become

Illustration 250



Geometric Forms and Bird Forms

Beginnings at Modeling

This picture at the right represents the first attempts of a beginner ten years of age and made at one sitting. First the large rosette, then the starfish, then the rosette with loops and then the small cantaloupe. The hands can be seen making the loop. The clay has been rolled out to about the thickness of a lead pencil and then is bent into position as desired. These pictures illustrate the simplicity of the work and the little plant that is required. Almost any object in the garden or the yard can be modeled.

proficient in this work, and that it is unreasonable to expect fine results at the first attempt. This is a constant failing with some teachers; they expect too much from little fingers.

A Good Box for the Clay.—In constructing clay boxes, see that they are made without any metal or slate lining. There is no substance better than wood or clay. In some schools I have seen zinc-lined boxes and slate, used through ignorance of this fact. Clay will not stick to a wooden surface, it sticks to metal or porcelain-lined boxes like wax.

Any carpenter can make suitable boxes. Of course the form can be modified to suit any sized space in the class room.

I have found it useful to use a case that runs up like a book-case, with shelves that are removable. It should be possible to put the shelves close together or far apart, as desired, according to the size of the work. If the work is on flat tiles, they can be put within two inches of each other; if it forms a large mass, several shelves can be taken out and the work put in without trouble. Doors can be put to the case to keep the work secure. Its lower part may open with lids. This is for the mass of clay, which should be easy of access on account of its weight. A spade can be used to keep it in good condition. The box may be made large or small, according to the size of the class or the number of pupils. A box 5x6 feet and 3 feet deep for the clay part will serve for a class of 200. The clay can be kept moist by means of pieces of flannel or blanket spread over it.

Illustration 251



Portion of the Modeling Room, Public School of Industrial Art, Philadelphia

The room accommodates fifty pupils, five at each table. Eight hundred grammar grade pupils and various teachers' classes rotate into this room each term.



Making a Ball of Clay

CHAPTER II

Elementary Courses in Modeling

MANIPULATION OF CLAY.—Take a piece of clay in the hand. I want you to learn something about its manipulation. Roll it out between the palms of the hands until it is as thick as the finger and about four inches long. Notice when you hold it by one end that it is limp, and will not stand erect. Now observe that I pinch the clay together and “wedge” it, making it a little firmer in consistency. “Wedging” is a potter’s term for solidifying the clay in this way. When I hold it up you perceive that it will support quite a weight, that it is strong. In every piece of work that we make we should endeavor to keep the clay wedged. Now I will take the same piece of clay and roll it out again two or three times on the board or between my hands. I rub it out and then roll it out again. You will now see that the clay is no longer plastic, but rigid, and that if I bend it, it breaks. This clay is now “rotten,” unfit for use. It has ceased to be elastic or pliable. Do not let children use it when it is of a consistency like this. “Rotten” is the technical name given to clay that crumbles like bread, instead of being tempered and pliable, or plastic. It can be improved very quickly by moistening and kneading over again, and it is then what is technically called “tempered” clay.

The Spiral.—Take a piece of clay about the size of the last joint of the thumb. Roll it out between the palms till it is about as thin as a slate pencil, allowing it to be pointed at one end. Then try to make a spiral (Illus.

Illustration 253



The Spiral

The form shown in this picture and the next is an exercise to test the texture and temper of clay. If the form can be made with a few turns of the fingers, the clay is just in the right state for manipulation.

253). You cannot do this at first, but with a little practice you will be able to do it well. I have had pupils try to make this form for weeks before they succeeded. Others can make it in a few minutes. The more you practice, the more skill you will get. It is good exercise in enabling you to determine the texture and the temper of the clay. When with a single touch and two or three turns you can make this form so that it will stand erect, and remain without falling, it shows that you can manipulate the clay when it is just at the right temper and texture. If it is a little too hard it breaks in a most

aggravating fashion. If it is a little too soft it does not stand up. There is a happy medium, and the sense of touch must become educated until it can feel the proper quality and produce it without any trouble. If you find that the clay breaks, put it to one side and try another piece. Do not use the same piece twice. When you can make a good spiral, you understand the texture of the clay.

Leaf Forms.—Take a piece of clay about as large as the last joint of the thumb, and roll it out in the palm of the hand until it is spear-shaped or resembles a spear head. Now take the form between the fingers and thumbs, as illustrated in 254, and beginning at the tip, with both hands make

Illustration 254



Leaf Forms

Exercise for manipulation of clay.

a leaf form. This is a little difficult at first, but with practice each pupil can make a midrib, show each of the veins and the serrations on the edge of the leaf, leaving it thick in the center and thin on the edge. At first there

is a tendency to break and crumble the edge, but when it has been attempted a few times the fingers will respond and a very good leaf will be the result. This is a good exercise in manipulation. It compels the use of both hands, and the complex form is the product.

Circular Forms.—Take a piece of clay about as large as the thumb and roll it out between the palms until it makes a good, slender roll about

Illustration 255



Moulding a Circular Form

four or five inches long. Now bend it and make both ends meet till it forms a ring. Then by the use of the fingers alone manipulate the clay so that the joint will not show and so that the ring is true and even all around. This is another good exercise, and one that requires skillful handling. It is still more difficult to make another ring interlacing with this one.

Hints to the Teacher.—When the children are making these forms do not allow them to break the clay in pieces; let them keep it in a lump except the portion they are using. Allow no crumbs to fall about the board, the desk or the floor. All the pieces must be put back in the main lump. If they are rotten, they can be placed at the left by themselves. From the very beginning, resist the tendency of the beginner to “make a dirt.” In a few lessons it will be found that pupils can model elaborate and complex forms without dropping or scattering the clay at all. It is simply a habit of neatness that must be taught, and if insisted upon from the beginning there need be no trouble with the “propensity to make dirt” that is wrongly attributed to clay-work.

When the children begin to make good forms do not allow their work to be destroyed. Place all pieces made on a shelf to dry. Then if they are not kept permanently, they can be sorted out, the good ones given to the pupil to take home and the bad ones mixed with the main mass in the clay-box. The same mass of clay can be used for years in this way, and continue perfectly healthful and free from any odor. Never allow the clay to remain for long periods in a damp state unused. If it is not to be used for a few months, permit it to dry. It can readily be moistened again when

required. The damp from the clay yields a musty and moldy odor which is not pleasant. If the clay is constantly used, it will keep fresh and sweet indefinitely. Covering with a moist, clean cloth will prevent drying.

Do not attempt to keep the clay in a crock or a tin vessel. A wooden box is far better. I have clay boxes in some of my schools that have been in use for fifteen years, and except that the bottoms are a little decayed, they are as good as new.

Tiles and other unfinished work should be kept on wooden shelves in the clay-box or closet. If possible in the class room devoted to modeling, shelves or ledges should be put around the room, on which finished work can be placed. In this way in a very short time the rooms

Illustration 256



First Exercises, Making Balls, Rosettes, etc.

can be decorated with creditable work produced by the pupils. This is inspiring to all and makes the place look like an art workshop.

Elementary Forms.—The following are suggestive of the simplest forms that can be made from clay without the use of tools, for the most elementary classes. Make some balls, by rolling the clay in the hand, about

the size of a large marble. Groups of these can be made. Make groups of three, groups of four, groups of five. Make a pyramid, make a star, and so on. Children of six years of age and upwards take pleasure in making these forms.

Illustration 257



First Exercises in Modeling

Other forms can be made by taking a piece of clay and rolling it out about as thick as a lead pencil and about four or five inches long. Make a little loop. This can be combined with others, making the following forms. (Illus. 257.) Little rosettes can be made by adding a center. Do not let the children make crumbs or pieces. Instruct them continually to keep their clay together and see that it is in perfect condition. It must be quite soft for very little fingers, and still not soft enough to stick. Make no attempt to do anything with the clay when it is sticky. Disgust is sure to follow if it is handled in that state.

Many simple rosette forms can be made. Make a form about the size of a small marble and then press it till it is nearly flat. Make a little disk or center. Combinations of these can be made. Make the

same form a little pointed at one end. A large series of rosettes can be made with the addition of a little ball or boss for a center. Bend the leaves up, make them cup-shape. Make some with points. With some thought an endless variety of these forms can be devised which will give a great deal of pleasure to the child and variety to the lesson. Be careful not to let the children tire of any of the forms. A teacher of course can make one of these forms in a half-minute, but for very young children two or three of the forms are quite sufficient for one lesson.

A number of natural forms can be made. Roll out a piece of clay into a ball, about the size of a marble. Press it till it is nearly flat, make a little stem by rolling out another piece, and we have a very good imitation of a mushroom. Bend the top over the stem a little and stick it on the board in a standing position. Make several sizes, forming a group. Easy fruit forms can be made by rolling out pieces till they form a ball about the size of a marble, then putting long stems to them, making bunches of two and three like cherries. Plums can be made with the small stems.

Animal Forms.—An interesting series can be made from various animal forms. Of course these must be reproduced from memory. It is wonderful how quickly the children grasp the idea of form after a few lessons in making these elementary shapes and how soon they get an amount of detail. But do not expect them at the first few lessons to master detail, since they begin to apprehend this only after they have taken notice of things, through the desire to make them in clay. Do not mind how poor the forms are the first few days.

Let us begin with a chicken. Take a piece of clay about the size of a small hen's egg. This will form the body. Now take another piece of clay and roll it in the palms till it is about the size of a small marble. Place this on the large piece for the head. Next add a little piece of clay for the bill, two dots or two little balls for eyes, and a few marks on the side for wings. If desired, a very short tail can be pinched out at the end. This can be made with a few touches to look like a very small chicken.

Next we can attempt a little duck form. This is more complex than the chicken, and can be made about the same size. Make the neck longer and give it a nice curve, make the bill a little longer and thicker. The tail can be made longer, and the wings marked a little more carefully.

A somewhat similar form can be made to represent the swan. It has

a body of the same shape as the duck, rather a little larger, with a long curving neck, which needs to be made separately and fastened on the body. See that there is a double curve in the neck and that it bends back over the body. Give it a nice swan's neck curve. Two wings can be made by

Illustration 258



Elementary Forms in Clay

All of these forms are suitable for very young children, and are first attempts made by beginners.

flattening out some clay, and they can be pressed onto the sides of the body so that they stand out. The result looks much more elaborate, but it is quite as simple to make as the chicken or the duck.

Understand the object of these lessons. It does not matter how grotesque these forms are at the start. The early art work of all races of people is grotesque and their products are often examples of how children should or do draw in the beginning. Very many adults, as well as children, cannot recall the shape of a duck in the beginning, but no one can endeavor to make it from memory without memorizing, the next time he sees a duck, a swan or a chicken, some part that he had never noticed before.

A specially valuable part of the lesson is the fact that it compels one to memorize form. If I am modeling a frog from memory, and do not know the number of toes, I may make three, four or five, but the next time I see a real frog I will satisfy myself on that point and fix that knowledge so firmly in my mind that I am not likely to forget it.

Usually I do not tell my children details of this kind. I prefer that they should learn the truth by investigation. Some people do not know how many toes a dog has, or a chicken, or a canary. If they are compelled to draw or model the form from memory, they discover their ignorance, and by observation of the real form they learn to grasp the detail. So it is with little children. At first the forms will be very crude, but when they begin to make things that they have investigated, it is wonderful what an amount of detail they will embody. Remember, these are simply generalized forms. Imagination is the result of a series of impressions. It is only when we have received a sufficient number of impressions through the different sense channels that we begin to be able to represent the essential facts of form. This work I sometimes call compulsory memory work.

Children should be encouraged to make clay figures of any kind they desire, clay horses or sheep or men and women, like the Mexican toys which imitate these figures. They should be allowed to give expression to their feelings and imagination with the pencil in making horses, buffalo, Indians, etc., ships, war vessels, etc. They will often be found to draw them with the same character and simplicity that the Indians do. They grasp essentialities and ignore details—the first thing desired in good work.

Other Animal Forms.—A starfish is a good form to model. Make the five tapering members first, about the same size, by rolling out to a point, and then join them in the center. Bend the form till it assumes a natural position and make the detail with the tool. Make several sizes of this form. Do not make them so large that they cannot be modeled with the fingers.

A snake about six or seven inches long is very good practice. Roll it out first in the hands and then on the board. Let it taper to a fine point, make the head a little thick, the neck a little thin, flatten the head, make the features, mouth and eyes with the tool, and then bend in a natural position. A good plan is to coil it with the head standing erect as though it

were going to strike. Another good position is to curve it, as though it were moving along the ground. A snake makes a series of beautiful curves in moving, and very nice forms can be made by modeling. Make

Illustration 259



Modeling the Snake

two or three. In the beginning, of course, only the most elementary kind of forms can be made to suggest a snake, but as the lessons progress with practice the body can be thickened a little in the middle, tapering to the tail, scales can be modeled, a forked tongue can be placed in the mouth, and so on. Children are fascinated by

these small living forms, and after a few attempts grasp many unnoticed details.

The fish form is one of the best of all shapes to make. Roll out a piece of clay about the size of an egg till it is a little pointed at each end, flatten slightly between the two hands, then add the pointed tail, making it quite sharp and thin on the edge. (Illus. 261). Let the body be thick in the middle and taper to the tail. Make the two dorsal fins thick near the body and tapering to a thin edge. Do the same with the pectoral fin on the side, and with the anal fin underneath. The gills can be marked with the tool and the eye can be pressed in with its point, or a little ball can be made to represent the eye, stuck on and then modeled. The mouth can also be made with the tool.

There is an endless variety of beautiful fish forms. In making this elementary fish form, however, a very simple shape can be selected, a generalized fish, or a typical fish form if you wish. A very realistic effect can be made by putting the rays and spines on the fins and tail with the tool. The scales can also be marked, and if the fish is curved a little it will look quite realistic. Numerous pictures of modeled fish occur in this work.

A small frog can be made. Take a small piece of clay, roughly shape it with the fingers about the size of the body of a medium-sized frog. The mouth can be made with the tool, two little balls can be stuck on for eyes,

the rough places on the back can be modeled with the tool, then the two hind legs can be made. Make the legs bent in the position of a frog sitting down. Then make the two little fore-feet with smaller pieces of clay, adding the toes last.

Next make a small turtle. Do not mind if some of the children have not even seen a turtle or cannot recall the number of feet it has. Make the body about the size of an egg, flatten, cut the division between the two shells with the tool, make the cavities for the four legs, a cavity for the head and another for the tail. Make a pointed tail, make a head something like a snake's head, partly flattened, and then the four flippers. Of course the teacher should be able to make each one of these forms quickly as a suggestion to the class, giving some idea of the size, and as much detail as possible. The pupils, however, are not to copy this model. They can look at it and recall the mental image, as far as they have gained one, of the turtle or tortoise.

A lizard makes a good form to model. Roll out the body just as we

Illustration 260



Modeling Various Natural Objects

form the body of a snake, make the tail taper to a point, make the neck a little thin, flatten the head, form the mouth, eyes, etc., with the tool. Then the legs can be formed by smaller pieces of clay bent and added onto the sides.

A little mouse can be made. Model the body, then add the long tail, the two ears, make the detail with the tool. If desired the feet can show peeping out from beneath the body.

These small life forms are suggested because children are especially fond of them, and although the product will be very crude at first, impressions are being made that cause the children to become very attentive to the forms when they meet with them again. Their ideas unconsciously become clearer and more vivid. Remarkable instances of observation of detail will constantly be made by pupils from particular forms that interest them.

Illustration 261



Elementary Modeling of Animal Forms

Vessel Forms.—A good exercise is to make a little vessel form. Take a piece of clay about the size of a small egg, press it in the center till you form a cavity, bending up the edge all around at the same time with the fingers, till it forms a hollow, cup-shaped form. (Illus. 261.) Do not let it become flat like a saucer. Make the base by pressing it on the board, and, by rotating it a little between the four fingers and thumb, it can gradually be made small and cup-like. Do not let it be thick and thin in places. Smooth away the little hills and hollows, and resist the tendency of the cup to spread out. Let it be about 1 inch or $1\frac{1}{2}$ inches in height and perhaps 2 inches in diameter and about $\frac{3}{8}$ inch thick. This is a splendid exercise for manipulation. Work with it till the rim or top is a good circle. Let the

base form a true circle. This requires a little more manual dexterity than one would think to make it good in shape. Endeavor to make the inside smooth and the rim a nice flat edge all around. Make different sizes. With a little practice small vessels for various purposes can be made,—little basins, bowls, vase forms and so on. If these forms are allowed to dry, they can be fired and glazed in any pottery for a few cents each. Beautiful little vessel forms suitable for pin trays, flower receptacles, salt cellars, match safes, etc., can be made.

Next take a piece of clay a size larger than that used for making the cup, and make a small shoe. The pupil can imitate a wooden shoe, or slipper or boot. Press in the cavity for the foot with the thumb and fingers. The point can be made to turn up, in the usual manner of a wooden shoe or Turkish slipper, or any other shape can be made as desired. Draw the attention of the children to the fact that the foot is wider in front than at the heel, and so on. It is wonderful what a variety of shapes the children can make after a few lessons. They will put rosettes of different kinds or buckles on the front, and sometimes make the shoe to button or lace. It requires the merest kind of suggestion to make the children observe in a very little while all kinds of shoe shapes, and to reproduce them. That is the object of the lesson,—to compel observation. A very good plan, if the children are making realistic shoes, is to draw attention to their own. Let them look at the foot and the shoe. Let them see how narrow it is at the toe or the instep. Let them look at the shape of the heel. This form also makes a nice little receptacle for pins or flowers, if fired. Allow the pupils to keep it when it is satisfactory and is not too rough.

The next form may be a bird's nest. Take a piece of clay, roughly shape it by making the cavity with the thumbs and fingers, working it around in the hands until it assumes a cup-like form. Now place it in the middle of the desk or modeling board, and with the tool make the ragged edge. Try to imitate the texture of the sticks and grass, and then bend the edge over till it is about the size of a nest. Do not let it be too regular, make the form irregular. Allow some pieces to stick out in an accidental fashion. Three, four or five eggs can now be made and placed in the nest. Be sure they are of the same size. (See Illus. 260.)

Take a piece of clay and make a rough tree stump. Pull up the edges to form the ragged stem of the tree. Let it be hollow and cup-shaped. Let

the edge be very irregular. Pull out a few roots, or model one or two more pieces of clay and add them for roots. Be sure they stick on, and that the clay is incorporated with the main mass. Do not simply press the piece on, but incorporate it with the tool so that when it is dry they will not fall apart. Do not make the roots or rootlets look like legs. Let them be irregular, one on one side and two or three on the other. Make the texture of the bark with the tool by a series of short, irregular marks. This also forms a very nice little receptacle for flowers, pins or matches.

A small basket may be made. Take a piece of clay, press in the center, making it hollow, and raise the edge; let this be about as thick as the cup form that we made. The basket can be made square, oblong, or elliptical, as desired. Roll out a piece of clay, bend it over, make a strong handle. Do not make these handles too thin. In modeling never make anything thinner than the handle of a small teacup,—a fine China teacup.

Illustration 262



A Modeled Tile

The pupil has completed the design in clay and is now trimming the uneven edges from the tile.

Anything smaller than this is sure to break with handling. The texture of the basket can be imitated with the tool. This makes a nice receptacle for various purposes. All of these forms can be placed on tiles, slabs or plinths.

In making a tile (Illus. 262) take a piece of clay, press it in the center of the modeling board, then take another piece and add to it, incorporating one with the other. Do this continually, turning the piece of clay and pressing it flat till it is about the desired size. Do not allow the clay to

stick to the board, fingers or tool. When you have a rough piece made about the size or a little larger than the size you desire, take the knife and flatten it. Keep turning the tile continually and give it plane surfaces by pressing it against the board with the knife. When it is flat enough and of even thickness, draw with the point of the knife on the top the size of tile you desire. It can then be cut with the end of the knife blade. Do not cut with the entire blade of the knife; use the end of the knife and let it pass

through the clay so that there is little friction. (Illus. 262.) When the children have a little more skill and desire to keep the forms they make, it is a good plan to mount them on tiles,—the animal forms, the fruit forms, rosettes, etc.

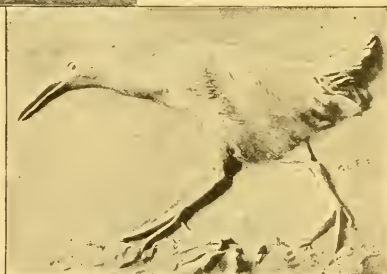
Illustration 263



The Real Bird

Directions for modeling birds from the real, or other animal forms, are given in Chapter VI of this section. Work of this kind is much more advanced than the elementary exercises in this chapter.

In making these elementary forms simplicity of work is one of the things to consider. Remember, the entire work is chiefly to compel the children to think of and to memorize form. Children instinctively endeavor to give expression to thought in all directions. The mind is worked upon and developed through the senses by externals, and it is to compel this union of thought and action that we make these seemingly trifling exercises.*



The Clay Model

Modeling in Clay from Birds

The panel below has been modeled, from the real bird shown at the left, by a pupil of the grammar grade. It is quite a good tile for such a young pupil. Perfection must not be expected from the children, especially when they have had but little experience. But the eagerness with which the children strive to faithfully imitate nature, and their enthusiasm over this contact with the real thing, are by no means the least valuable characteristics developed in the young by the natural education.

* Ideas are, on the efferent or motor side, nascent movements—that is, intuitions of such movements as have been performed; on the afferent or sensory side, they are images of the sensory impressions which have been experienced, the revival of such sensory impressions on the occasion of a suitable external stimulus being *perception*.—[Maudsley, *Physiology of Mind*, page 443.]

Many adult minds are paralyzed or wanting in certain directions at maturity. Never having been required to perceive accurately, they do not remember correctly, and so they cannot judge soundly or imagine truly. As I have repeatedly quoted, "accurate perception and exact memory are the fundamental bases of sound reasoning and imagination." Do not be troubled if the results are not artistic. They are sure to be pleasing to the children, for children are like savages in some of their stages of development.

Many people speak of the necessity of art atmosphere in the school room, and in some places or cities fragments of the antique,—statues like the Elgin marbles, the frieze from the Parthenon, the Venus of Milo, etc.,—are placed in the school room.

I find, however, that these forms do not impress the children. I would rather see the same money spent on natural forms—real butterflies, birds, fish, shells, good specimens of minerals, etc. We must make the children love nature at first hand. We must inoculate them with the desire for beauty through the real living forms in nature. Then, later, we can expect some result when they come in contact with the great art works,—the thought of great minds expressed in concrete forms. But it is useless to put before their eyes the perfection of Greek art unless we first give them the hunger and thirst, the vital love for beauty as it is exhibited in every natural flower, leaf, and shell, and in the various living forms that attract and fascinate the young.



Various Leaf Forms, Models



Clay Modeling
Modeling original designs on a curved surface. Grammar grade children.

CHAPTER III

Modeling Fruit and Vegetable Forms

FRUIT FORMS MAKE A GOOD SERIES OF OBJECTS to work from. Endeavor to have the real fruit if possible. We can start with an apple. Let the children take up the apple in their hands first and observe its shape. Draw their attention to the stem end, how deep it is; to the blossom end, how shallow it is. Let them continually handle the form, during the lesson. It is good to study the colors of fruit forms. Draw their attention to the beautiful shades and hues of green or red or

yellow, as the case may be, on the apple. Make them aware of the facts before them by speech as often as possible. Take a piece of dry clay and roughly shape it in the fingers. Do not let be too large,—make an average-sized apple. Some of the apples will be large and some small, but it is best to choose one of medium size. Do not let the children make any of the forms in miniature. It is very absurd to see a lot of apples modeled by a class, as small as cherries, to see grapes modeled as small as peas or currants, and pears as small as strawberries. In every case let the children make the forms about the average size of real fruit.

Use the tool now to make the form smooth, working it all over the apple without scraping the clay. Mold it. Do not allow clay to stick to the tool or to the fingers. Be very particular about this. It is a sign of error if the children have clay on the wrong side of the fingers or sticking to their hands anywhere; or if it is sticking to the board, the tool or the knife. The clay must be made compact, by often caressing it with the tool. It is somewhat difficult at first to prevent the tool from scraping the clay, but with a little practice it can be done. Do not mind if the form is a little rough or shows the tool marks, in the beginning. Remember, this is simply to get dexterity with the hands and the tool. We do not care for the product of the first efforts.

Make the cavities at each end with the tool and endeavor to keep the convex curve like the model. One or two little touches with the tool will give the appearance of the blossom end, and then a little piece of clay rolled out and inserted will form the stem. Let it stick to the side of the apple so that it will not break off when dry. There is a great deal of character in the stem of an apple. It is usually short and thick, therefore do not make the stems too long, as is frequently done. It is absurd to see apples with stems almost as long as cherries. Do not let the children use the stem of the real apple in the clay apple, as they are frequently taught. This is simply trickery. Any child able to make an apple will take pride and pleasure in making a good stem to it. The only people I have found who complain of certain of these exercises being too difficult for the children, are the teachers who could not make the forms themselves.

Continually draw the attention of the children to the minor facts of form visible on the apple, and by degrees they will perceive, apprehend and reproduce these forms. Do not, except in special cases, perform the work

for the pupils, but make them consider the form for themselves. It is the idea of an apple that you wish them to assimilate. The clay form or product is not of much consequence. Think of this continually. It is the concept of apple firmly locked into the mind in all its various aspects

Illustration 267



Plaster Casts for Modeling
When the real fruits or vegetables are not available.

through the senses that you desire to produce. It is a very good plan at the end of the lesson to let the pupils, if the lesson has been satisfactory, actually assimilate the apple and test its gustable qualities. This adds to the permanent impression, remember, and is a very good lesson, and one that is usually enjoyed. It will do no harm to speak of the structure and the texture, the color and the taste of the apple at this stage.

Illustration 268



Vegetable and Fruit Forms for Modeling

Another point to speak of before we leave the apple is, not to allow the children to make freak forms. Usually in a large number of apples there are one or two that are very much distorted. Draw attention to the typical apples. It is not necessary in the beginning for the child to make

all the accidental kinks, creases or curves that are on the apple. It will be sufficient if they make a good generalized form in the beginning.

The Pear—Is more complex than the apple and requires a little more thought and care. See that the pupils have good models, nicely shaped pears. It is better to have a few good ones for the class, even if they cost more, than to give out a lot of poor shapes that are perhaps cheap. Take a piece of clay, roughly shape it like the pear, depressing it at one end. Use the tool to smooth the surface, as described in making the apple, always getting the main form of the pear first with the hands. Do not make the forms too large. It is the tendency with all beginners to exaggerate the size.

Do not hesitate to take the tool in the left hand continually. It feels very awkward in the beginning, but in all modeling the tool has to be used sometimes with one hand, sometimes with the other. Later on, in large forms, the tool is held a great deal with both hands. Notice that the blossom end is not so deep as in the apple, that the stem end has a distinct character, and that the stem is usually a little longer than the apple stem. Of course there may be exceptions. Notice also the difference in color of the pears and in the texture of the skin, some pears being quite rough in texture, others smooth.

With a little practice texture can be imitated very successfully. The smooth chubbiness of a tomato can be rendered; also the texture of cloth, velvet, fur, and so on. Of course at first the children can not try for any of these qualities. I simply mention them to show the possibilities in clay, it being the most plastic medium of which we have any knowledge, and one which, for that very reason, has been used by sculptors from the beginning of history.

Hints to Teachers.—Make the children handle the model, let them look continually at it and compare it with the one in their hands. Invite them to observe other pear shapes, show them the typical ones from the number that you are using. By this time you will find that the children are unconsciously using either hand and that they are actively busy with the touch, the vision, the muscular sense, in the work of assimilating impressions. In doing this work, also notice that they are overcoming awkwardness, for at first, when the tool is used in the left hand, it will feel and look very awkward. That, however, is soon overcome.



Some of the Barge Casts

The modeling is bold and broad. They are beautiful models for children to work from in clay and also for drawing in pencil and charcoal.
(213)

It is habit only that compels the arbitrary use of the right hand in many operations; and the habit of using both can be just as easily taught.* Parents begin the wrong way by compelling children to "take the spoon in the other hand, dear;" to hold the pencil or fork a certain way; to change the scissors if they happen to pick them up with the left hand. Surely it is good to be able to cut with one hand as well as with the other. I have never yet found a doctor, dentist or scientist, or skilled user of instruments, who does not agree with this. In fact, they say that to be able to use both hands is a very valuable capacity.

The Banana.—Take a piece of clay, roll it out, make it four or five inches long. Some bananas are very large, but the large sizes are difficult for the children to handle. As we have learned by experience, the medium sizes are the best for practice. Try to make the planes by drawing the tool or the finger from one end of the banana to the other. Sometimes they are four, five and six-sided. Try to grasp the character, to apprehend the main forms. The shape is a little difficult to make at first. Draw the attention of the class to the color and other characters. Other forms that can be made are the peach, the lemon, the plum, the grape, and in fact any available fruit.

Fruit Tile.—A good lesson and a very simple one is to model a tile with a branch of fruit forms on it, making the twig, the fruit, the stems and the leaves. Make the tile about eight inches long and about four inches wide. Do not trim the tile till the fruit forms have been modeled. If you trim the tile in the beginning the edge will be scarred or marred before the form is finished, and then it has to be trimmed again. Leave that for the last thing to do. Take a piece of clay, roll it out about the size of a lead pencil, about three inches long. Shape the end of the branch, allowing it to be a little thick at the lower end and tapering to the top. Place this in position on the tile. Then add another piece about the same length and also tapering, and bend it to form the shape of a branch or twig. Continue this from one end of the tile to the other.

* Habit—self-respect, self-help, application, industry, integrity, all are of the nature of habits, not beliefs. Principles, in fact, are but the names which we assign to habits, for the principles are words, but the habits are the things themselves—benefactors or tyrants, according as they are good or evil. It thus happens that as we grow older a portion of our free activity and individuality becomes suspended in habit—our actions become of the nature of fate, and we are bound by the chains which we have woven around ourselves.—[Smiles, Self-Help, page 404.]

Next make one or two branches. Make these branches fork out in a realistic fashion. Be sure the clay is thoroughly incorporated with the main branch. Use the tool to do this, also to incorporate the stem or branch on the tile. A few little digs with the sharp end of the tool will unite them and then the marks made can be removed by a little modeling. Imitate the bark of the cherry tree on the stems or branches and allow the branch to bend up in one or two places. Next make two or three cherries of the natural size. Place them in position to form a group. Then make the stems; let them be of the right length, 2 inches or $2\frac{1}{2}$ inches long from the cherry to the branch. The cherry stems of course must be made much thicker than they are in nature, about as thick as the handle of a very fine teacup. It is a little difficult to incorporate these thin stems to the main branch and to the cherry without breaking, but with a little practice it can

Illustrations 269-271



Casts of Leaf Forms

be done. Bunches of three cherries can be made, placing one on top of the other two, and the stem placed in the same way. Make one or two bunches of cherries, as desired.

Lastly, make leaves as described in "Elementary Modeling," and endeavor to get the fine points, the serrations, the midribs, and other features with the fingers before placing the leaves in position. Bend each leaf so that it will look as natural as possible. Allow the edge to curve up in one

or two places. Make several leaves in this way. Cherry leaves are long and slender, two, three and four inches long and about one inch wide. Place the leaves in different positions to see the effect before incorporating them. This is quite important.

Make a Composition.—Four or five leaves will be enough for this small tile. Then take a tool and incorporate the leaves carefully with the branches and with the background of the tile. See that they are well supported underneath. If necessary, block them up with clay so that they have a solid backing connecting them, though invisibly, with the background. Allow the edges of the leaf to be quite thin, but let the body of the leaf be thick and strong. A leaf can be made to look as thin as paper by making the edge sharp though it really may be half an inch thick. Allow the leaves to curve naturally, and do not place them at regular intervals. It is a little difficult at first to prevent their looking like pieces of tin. This is a very good exercise for young people, because even though it is roughly done, the product usually pleases them.

An apple with a branch and several leaves on a tile is a very good exercise (Illus. 272). Make the tile first, then the apple, as described in our first exercise; place the apple in a natural position on the tile. Then incorporate it so it will not drop off when the clay dries. To do this, press part of the apple firmly into the tile, and then remodel with the tool the parts marred. Next make the piece of branch of the apple tree about three inches long and place it in a natural position near the apple, making the stem reach the apple.

Next model a few broad simple leaf forms and attach them in a group to the branch. Take care to make the leaves look as natural as possible. Let them be thick in places, and where the edges show, allow them to be sharp to suggest thinness. To give strength make all the parts solid that cannot be seen. Never attempt to make things too thin in clay, like leaves or stems or twigs. It is better to make them solid down to the slab, rather than to have them so thin that with a touch or two in handling they break. Try to show the curved surface of the leaf and the serrations with the tool. It is a very good practice in composition to arrange these little groups.

Two peaches, with branch and leaves, also make a very good exercise. Make the peaches on the tile first, side by side. Next make the

branch and then the leaves. Try to grasp the character of the leaf forms and the arrangement.

These exercises are very good in learning to fit form on a surface, and also for giving the children a great deal of pleasure. For these forms, of

Illustration 272



Modeling Fruit from Nature

This picture illustrates another child modeling an apple on a branch, with leaves, from the real form out in the open air. The table is a box with a board upon it; two modeling tools and a knife only being used. First the tile is made, about seven inches square, then the apple is modeled in the hand. As soon as it is the right size and with a certain amount of finish, it is incorporated on the tile in the usual fashion; then the stem is made, and lastly the leaves. It is very good practice making the character of the branches; they are quite rugged and have distinct textures. The same is true of the leaves; the apple leaf is a broad one and finely marked. In making a tile like this, the leaves can be made solid, then the edges can be slightly raised and undercut.

course, models may be used. If you cannot secure the real fruit, stems and leaves, casts can be purchased at a very low price. The teacher should have models of this kind that she has made from real forms herself to show the pupils.

Vegetable Forms.—Let us begin with the potato. A potato has a rough, irregular shape, but still it has its own essential character. Have the

children make a typical one; take away the unreal shapes. Make the eyes of the potato with the tool. Let them study the model in their hands, and draw their attention continually to facts. Do not let them miss any of the characteristic features of the potato. The form will stick in their minds when they reproduce it with the tool. I cannot resist the tendency myself when I am talking to my class to interject a stream of facts and fancies about the forms we handle. Splendid ideas can be grasped if the teacher is awake. It need not be a lesson in modeling only, but in many other things. The surface texture of a potato is quite different from that of fruit. Make the children apprehend this. But because potatoes are familiar forms and easy to get, do not tire the children with them. Lead them to appreciate the tints or coloring of the potato.

The carrot is a little more complex. Do not let the carrot look like a parsnip or a radish. Let the form be of a handy, medium size, and make the texture marks with the tool. Seethatthe children apprehend the texture. Do not let them make simple cuts or jag marks. Give them a little time to grasp the detail. Have them handle the model as much as possible, since much information is conveyed to the mind through the touch. Do not try to model the top or the leaf part of the carrot. Let it be cut off, just showing the stem. This can be modeled with the carrot or added on.

The Tomato.—Take one that shows the typical form. Some are very much distorted and some do not have the features clearly marked. Make the divisions with the tool. The stem end will be found a little difficult. Have the children make the leaflets separate and add them on. It is difficult in making the ridges to prevent the form from looking like a little cantaloupe. Do not place the ridgestoo regularly. Use the tool asmuch as possible in making the texture. It is very smooth and gives good practice.

These vegetable forms may seem trifling in their value as a mode of compelling thought, but very few adults realize the shape of even the most ordinary vegetables, simply because they have never consciously assimilated through the different sense channels all the facts about them. Their imagination is not vivid because their impressions have not been distinct or clear. The slight percepts that they have fade away, and it is surprising to find how many pupils there are even in adult classes who show that they have not the beginning of an idea as to the shape of an egg or a grape, if

they are requested to shape it without the model. We can create talent and capacity in the dullest people by teaching them observation in this way. There are plenty of people with good eyesight who go through the world

Illustration 273



A More Complex Form for Modeling in Clay

It is wonderful with what fidelity the children may reproduce even a whole branch in clay, with all its fruit and leaves. One work of this kind will impress the pupil with many of the fascinating lessons Nature offers so bountifully. When an important composition has been well modeled, it should be fired, and may also be multiplied by plaster casts.

without seeing anything, and there are many with very poor eyesight who, aided by observation, notice many things. Modeling compels observation, perception, reflection and conception.

The Turnip.—Make a medium-sized one, pinching out the root and modeling on the opposite end a part of the leaves. The variety of form we have among root crops is wonderful, and it is by receiving these vivid impressions, through making them, that we are fully impressed. The texture, structure, color and form of the commonest, simplest vegetables are valuable as lessons, if we can organically and permanently register them without wasting the time and energy of the pupils. Some turnips have

beautiful tints of color and shading; some are a little rough in texture, and others, like the Swedish turnip, are quite smooth.

Hitch on to your lesson as many facts as possible. Do not let the work become drudgery. Many other vegetable forms can be given, but do not let the pupils tire of any one. Give them variety. We all need it to keep our faculties and our interest in trim. It is a natural craving that we have for new fields to conquer. It is not right to teach only a few set forms continually instead of the variety that Providence provides for our special study and delight. The children cannot readily eat the raw vegetables, so that you must make up to them for it by giving them more food for thought, taking extra pains to make the accompanying talk both interesting and instructive.



Plaster Model of Shield



Models of Plaster Capitals

CHAPTER IV

Modeling Geometric Forms

THE SIMPLER GEOMETRIC FORMS can be readily modeled into shape. They are not very pleasing or interesting, but they yield useful and necessary lessons, and in teaching little children this is the only palatable way in which these uninteresting exercises can be served. The child's awakening mind can grasp only what it sees,—an absolute thing, and here we give it the opportunity to grasp geometric form itself directly, not through a needless definition.

It is wrong to tire the children with these abstract shapes. The geometric forms are essential and necessary at certain stages of education, but to present them continually all through the various grades creates intense dislike. Except for modeling a few times, they should not be used in the early stages. I have known children to be completely spoiled for art work by having these unmeaning forms presented to them so often.

Experience teaches that there is a feasible size for these geometric forms. In some schools they are made very large, and in others much too

small. The best way will be to make the forms of a size that can be readily grasped by little children and made without the use of tools by the two hands alone. Many of the geometric forms can be seen in the pictures in Chapters I and II of this section, also on page 231. They are shown about the proper size they ought to be made.

The Sphere.—Take a piece of clay and roll it in the hands till it forms a ball about $1\frac{1}{2}$ inches in diameter. It is quite difficult to make this a true

Illustrations 278-280



Models of Pilaster Panels, Italian Renaissance

sphere, but by manipulation with the thumbs and forefinger, rubbing away the hills and making the rough places plain, and then rolling it between the palms again, a good sphere can be produced (Illus. 252). In making this series of forms it is advisable to have the pupils place the forms as finished along the top of their modeling board or desk.

The Cube.—Next make another sphere similar to the first and of the same size. This can only be done by comparing the two. Place them side by side and take away or add clay till they are equal. Now take the second sphere, and tap it on the board till a plane about one inch in diameter is made. Next turn it over on the opposite side, parallel to the first plane, and make another plane in the same manner. Be very particular to have the pupils endeavor to get these planes really parallel through observation. Let them continually look at the form in their fingers.

Next tap two more planes opposite to each other, and then two others, making the six-sided cube. It is a very good exercise now to make these planes merge together by tapping on the flat board until the form is a true cube, with sharp, clean corners and each plane equal. To do this with any accuracy requires constant attention. Make the children pay attention. This is an excellent form for teaching a number of very desirable qualities. Resist the tendency, especially if there is a large class, to tap the cube carelessly on the board. Be sure that it is grasped correctly, and that the children continually look at the form. Pay strict attention to position. See that the pupils sit constantly erect, keep their heads level and take inspiration.

If they have to look at the cube in their hand, let them hold it up. Do not let them tip and turn the head to look under it. If you wish to see

Illustration 281



Reducing Acanthus Leaf Forms

Antique model. The work is placed upright on an easel, for convenience.

things straight, you must look at them with the head level. Do not expect little children to make very sharp corners or very correct cubes in the beginning. With practice a perfect cube can be made if the clay is in right condition, with sharp edges and fine corners. Any teacher can perceive

that to get these six planes equal in size with the hand and eye alone is good training. To do it a few times is also pleasing, but it is not wise to tire the children by giving them the geometric forms continually, as is so foolishly done in many schools and even in the kindergarten.

In this work of modeling, we are using the master sense of touch, aided by all the others working in unison. This form of representation produces a healthy activity of the perceptive faculties that is valuable. Here we are dealing with form itself, actually making it. We are getting all around our subject and are in this way made conscious of all its peculiarities. We are getting accurate perception, which precedes exact memory, by performing deeds. It is this quality in sculpture which raises it above painting and drawing and places it at the head of the creative arts. It is for this reason that sculptors' drawings often possess those characteristics of strength, boldness of line, truth, which can come only from a thorough knowledge of the subject, gained during many years of contact with form, not simply by looking at it, but by actually making the forms.

We never really know form until we have attempted to reproduce it a number of times in the solid. One of the chief objects of these lessons is to impress this fact on the pupil while studying and trying to make these objects; even though the object is not well made, you are really gaining mental development, you are making these things a part of you to the extent that you gain just perception of the thing modeled. You are assimilating concrete knowledge through several sense channels and must become richer in mind for it.*

The Cylinder.—Take a piece of clay and roll it out between the palms until it is about one inch in diameter. Gently tap each end on the modeling board. Let the cylinder be about two inches in height. It is quite difficult to get the ends smooth and flat in the beginning. If it is rolled too much, a hole will form in the end. Use the tip of the finger or the thumb and fill the hole, and gently pat again until you have a true circle at each end. Resist the tendency to make it too long. If it is too long, pat down until it is short and roll again. Place the cylinder next to the cube.

*"The human brain is an organized register of infinitely numerous experiences received during the evolution of life, or rather, during the evolution of that series of organisms through which the human organism has been reached."—[Spencer.

The Square Prism.—The next operation is to repeat the same cylinder. It is a little more difficult to make this one match the other. Then take the second one, and by tapping on opposite sides, as in forming the cube, make four planes, converting the cylinder into a square prism. Do not make it too long, but let it match the cylinder in size. The chief difficulty will be that it tends to become too long. Keep tapping it, and continually observe each plane, till it becomes a good square prism. then place it by the side of the cylinder. If you have a large class, notice that

Illustration 282



Modeling a Head

This picture shows one position of the hands in modeling a head. The thumbs are "feeling" the form near each eye. Sculptors frequently model portions of the figure with the fingers alone.

there is a tendency to rap the forms on the board without looking at the result. Make the children look to see what they are doing. Do this continually.

The Cone.—Take a piece of clay, roll it out in the hand so that it becomes of a cone-shaped form, and pat it on the end, to form the base. Make

the form in the hands roughly first, and then use the flat board. It must be rolled till it makes a perfect circle on the base. This form is difficult and compels the use of a good deal of manual dexterity. Do not make the cone too high. The tendency with all beginners is to make spear points or little steeples. A great many of the cones used as models have this fault of form.

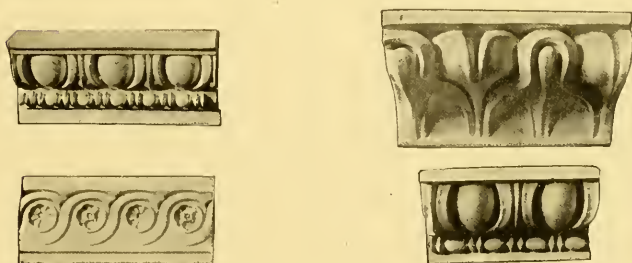
Let the cone be the same height as the cylinder and square prism. As soon as it is finished to your satisfaction, place this product beside the square prism. Then start another cone and make it of the same size as the first one. Notice in making these forms that we have made a pair and turned the second one each time into something else. It is very good practice for gaining size and proportion, to make one like the other. The second cone we will turn into a square pyramid by tapping the planes on the board. This is still more difficult to keep in shape than the square prism or the cube. The base must be a good square, and the four sides must taper to a point and the pyramid must be of the same height as the cone.

Many other geometric forms can be made. The series given, however, will be sufficient to illustrate the process. The forms suggested are the result of many years of experience with numbers of children and teachers, and, if the operations are performed properly, must result in valuable training. Do not tire the children with these forms. Remember continually that they are abstract forms. In the higher grades, when the children are studying geometry, they will have plenty to do with them, but do not disgust them with abstractions, as is so frequently the result in those schools where geometric forms are reproduced year after year till even the sight of them is abhorrent.

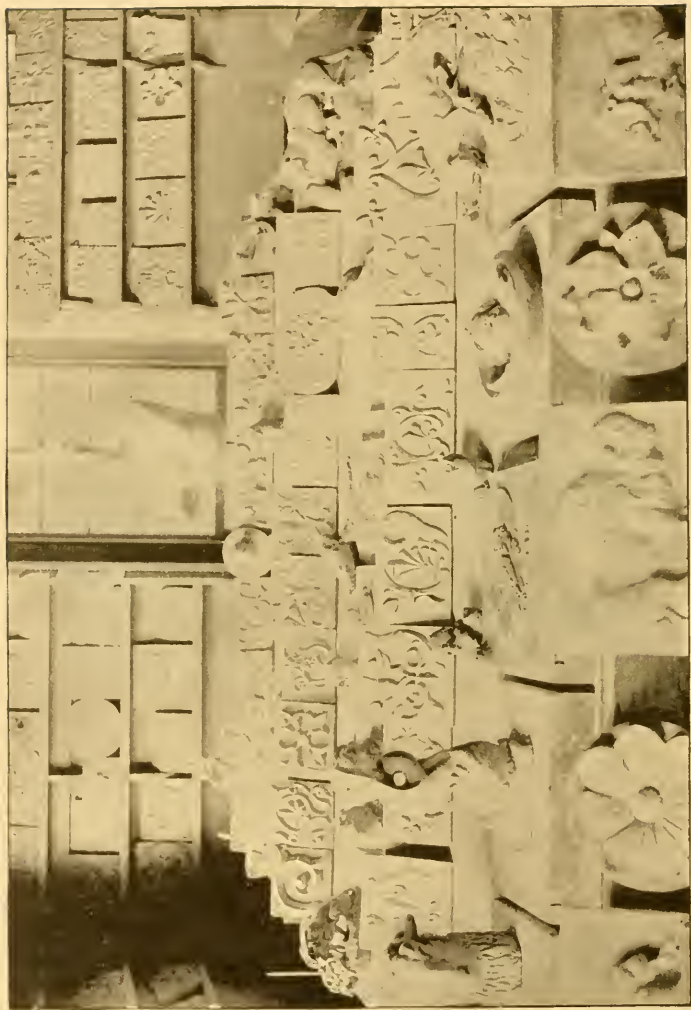
Notice that I have made this series of models to present a series of transitional steps, each one a little more difficult, and that the forms can be made without the use of any instruments or tools. Children will take great pleasure in modeling these forms a few times, and that is the reason we give them in the beginning, just as we give blocks to play with. But the essential things are natural forms.

In teaching, never mind the abstractions, continually think of the impression that you desire to make on the mind through the eye and the hand. If the impression is clear and distinct, the form will be clear and distinct. If not, it will be cloudy and nebulous. In talking to teach-

ers, continually speak of the co-ordination of the mind and senses, the tactual, the muscular and the visual, and of the power of observation this work gives one, thus enforcing the acquisition of exact knowledge. Teachers must realize that they are not simply working in clay, modeling common forms in common clay, making "dirt pies," as some ignorant teachers say, but they are molding the human mind, they are shaping the "stuff" out of which immortal souls are made.



Models of Various Borders



A Collection of Pupils' Work, Modeling Room, Public School of Industrial Art, Philadelphia

All the forms have been made by grammar grade pupils. About eight hundred rotate into this room each term. All finished work is kept by pupils. The animal forms are modeled from casts. The casts are kept on high shelves around the room



A Shell Form for Modeling

CHAPTER V

Modeling for Grammar Grades

IN MODELING THIS SERIES OF FORMS the pupils will pay particular attention to making fine curves, and getting clean, sharp detail and perfect backgrounds,—that is, making the tile of even thickness, with sharp, true edges, and so on. These forms are also good for grammar-grade pupils, and have been tested for many years with thousands of children. The entire series is the result of much care in selecting forms that will do the most good in the shortest space of time. The forms are graded in accordance with their increasing difficulty, and include the elements of the best styles.

The single forms must be made thoroughly well by the children, and then they can be used in combination. It is not necessary for the pupils to make the whole series. As soon as they have grown expert with the scroll

and the leaf, combinations in the way of decorative tiles can be made, using both leaf and the scroll. As soon as the anthemion and scroll have been made, these can be similarly combined. As soon as one of the rosette forms has been mastered, it can be used in combination with other forms. The same may be done with shells, the Moresque unit, the Saracenic unit, etc.

In Making the Scrolls (Illus. 288), build up a good solid tile at least one inch thick and six or eight inches square. Do this with the hands alone,

Illustration 288



A Scroll in Clay
With another scroll flowing out from it.

piece by piece, as described on Page 206. Do not allow it to stick to the board. When it is about the right size, make it plain and smooth by means of the knife, but do not trim the tile till the form is finished; let the rough edge remain to protect it. The last thing done should be to cut it square and true when the entire ornament has been modeled. Now take the end of the tool and draw on the tile a good scroll, similar to the one illustrated. Practice doing this many times. It can be rubbed out with a touch of the palette knife. The freehand drawing on the clay

surface is excellent practice, and with all my classes, adults and children, in the beginning I invariably have them sketch the form for five or ten minutes freehand, since at first it may be a little too large, then again it may be too small. Illus. 289 shows a child making the single scroll in clay.

Make the scroll so that it fits and fills the space. Let the ball come near the center of the tile. As soon as you have a satisfactory drawing, take a piece of clay, roll it out about two or three inches long and about as thick as the finger, and place it on the drawing. Then take another piece and place it in the same position, continuing until you have the scroll roughly formed with the clay. Next, take the tool and press it into the piece of slab and endeavor to get the curves. The raised edge in the middle of the modeled form is the first thing to get. That is called the "modeled line." Press away the surplus clay and try to swing the tool around the whole length of the curve from one side to the other. Make long, continuous touches. The clay must be exactly right in consistency. If it is too

PLATE SEVENTEEN



Forms Suitable for Elementary Schools

First a few fruit, vegetable and geometric forms, next a series of the various units of design, then a number of arrangements. Some of these patterns are quite elaborate and show fine modeling. The units of design are made and memorized before arrangements.

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soft it will stick to the tool. It is better for it to be a little too stiff in the first place than too soft, especially for the tile itself, although of course the harder the clay the more difficult the form is to make in the beginning.

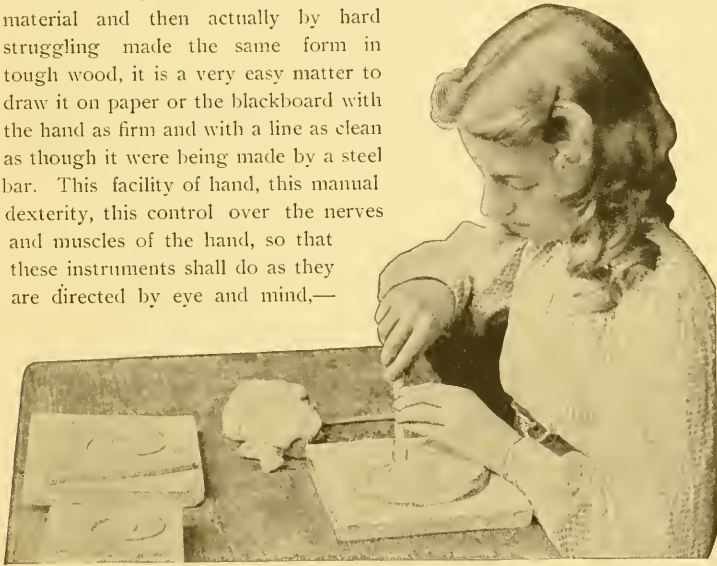
Grasp the tool in both hands as illustrated in most of the pictures showing pupils modeling. Of course the hands move about in different positions as the tool moves. At first it will be quite difficult to sweep the curved end of the tool from one side to the other, making half the circuit or even the whole circuit with a single sweep, but with very little practice manual dexterity will be acquired that will enable you to make a single touch continuing all around the scroll with ease, swinging the tool back and forth on the curve. Notice in doing this that you are actually drawing in material. Do not mind how rough the work is if you can get this swinging movement. Resist the tendency to scatter clay crumbs on the work, keep all pieces in the hand or in the main lump. The form or raised edge must be equal in height all over the tile; do not let it be thick in one place and thin in another. It is quite difficult to get this quality at first. As soon as the curved surface of the scroll has been made, then the form can be clearly cut out by vertical cuts on each edge of the scroll and the surplus clay removed, keeping the tile flat and smooth.

It is not easy to work in the center around the ball, to get into the corners, to keep the edges sharp, at first, but with practice this can be done. Do not mind the tool marks showing at first. We do not want the work finely finished or polished. Try to make the curves as true as possible. Eventually, the longer the swing of the tool, the truer and better the curve will be. Do not let the curved lines look as though they were bent.

This is excellent practice in getting the hands to swing curves, and it is by modeling and carving these forms that we enable our children to draw them with such boldness and facility that it surprises outsiders who do not know of the work they have been through. All our children make these forms. I cannot recall now, among the many thousands of pupils I have had, one who was unable to draw, model or carve these conventional forms if he learned how to do it in this way. Of course if pupils have been allowed only to draw, or to model, or to carve, I am sure many would be unable to draw the forms; but being required to do the three things in rotation, one after the other, they get a manual dexterity that makes the form

organic, and enables the hand in the end to make the form automatically—without conscious thought—as can be seen from the various illustrations showing forms modeled by pupils, where the scroll is shown in combination with other forms, sometimes ten and twenty times over. All the units of styles, and most of the drill form units, are modeled and carved as well. Any one can see what a great help this is in making forms organic. But when we have actually, through the sense of touch, made the form in soft material and then actually by hard struggling made the same form in tough wood, it is a very easy matter to draw it on paper or the blackboard with the hand as firm and with a line as clean as though it were being made by a steel bar. This facility of hand, this manual dexterity, this control over the nerves and muscles of the hand, so that these instruments shall do as they are directed by eye and mind,—

Illustration 289



One Position in Holding Modeling Tool, while Turning a Scroll

Both hands are used and work equally, the tool changing position constantly—sometimes the concave side being used, sometimes the convex. Endeavor to make free swinging touches as long as possible; do not allow the hands to rest on work. In the above picture, one hand rests to enable photograph to be taken.

are among the highly desirable objects of manual training that can never be attained by the limited exercises of mere shop practice. Wood carving is of wonderful value in accomplishing this hand training and character growth.

The Rosette Form.—The next form illustrated (page 235) is the rosette. Make a tile eight inches square, as described before. First draw the rosette with the tool freehand, making it to fit the tile. Make the center of the rosette in the middle of the tile and then the four leaf-like forms one after the other. Do this entirely freehand. Do not make construction lines. Rub out the drawing with the knife and practice the drawing of the rosette several times. Then start with the center boss. Let it be about one inch or one and one-half inches in diameter. Be sure that

the clay is incorporated in the tile by mixing the boss with the substance of the tile, so that it will not drop off when the form is dried, then model the surface with the tool till it is a true hemisphere. It is quite difficult at first to swing the tool over from one hand to the other in making this curved surface, but by persisting a little it can be done almost from the beginning.

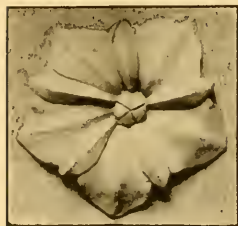
Next we make the four leaf-like forms, shaping them roughly in the hand first. Let them be about one inch thick, sloping down to the center or boss, shaped almost like a large tongue. Make all the four forms before

you place them in position and see that they are equal in size. When this is done they can be placed around the center boss. Squeeze the forms into position, being sure that the clay is roughly incorporated into the tile. If it is simply pressed on the tile, it will be sure to drop off when the tile dries. All these directions are not only essential to making a good tile, but such thoroughness helps mind and memory.

Remember this: The clay must always be incorporated, one piece of clay worked into the other, if you wish it to hold together. It is very exasperating to make a number of forms and then when they dry up to have them fall apart. This is usually the case unless care has been taken every time to incorporate the clay with the main mass. Each piece as it is put on should be made one with the parent piece.

Now the rosette must be tooled into form. It has been roughly shaped with the finger, and now we take the tool and make the cup-shaped

Illustration 290



A Complex Rosette



Various Positions of Tool in Modeling Rosette and Shell

The tool is sometimes grasped in the right, sometimes in the left hand. The hands must swing freely over work, care being taken not to make small patches or pieces.

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hollow on each leaf with a single stroke if we can. Pass the tool over the surface of the leaf many times and then over each of the other leaves. Do not turn the tile.

The object in this exercise is to make the four leaves in four different directions while the pupil keeps the same position in relation to his work. See what a wonderful amount of muscular co-ordination is required to turn the hands, both hands guiding the tool, in such diverse positions. Perhaps we can make the leaf quite readily and easily on the right side, while it is very difficult to make it on the left side. Perhaps we find the lowest leaflet quite easy to make, then we find it quite difficult to make the upper ones, with the same movements reversed. We must, however, resist the tendency of the pupils to turn the tile around, thus making all the leaflets in the same way, and allowing the hands to make only those few movements which they find easy to acquire. Remember, this work is educational, and the object of this lesson is to enable the hands to make the physical co-ordinations all over the complex surface in the different directions. When your hands can move readily with ease all over these four leaflets without awkwardness, it indicates a great amount of manual dexterity.

Do not mind the form being rough in the beginning. Make the edges sharp and clean, let the tile be smooth and flat. Make a good broad edge on the leaf. Do not hesitate to make the touches all over the leaf many times. Do not expect it to be finely finished with a few touches. The touches must be repeated. Do not finish up one leaflet at a time, making it very fine and smooth all over. Roughly finish the whole series, and then go over them again. Avoid finicky, small, feeble touches. Avoid picking the clay and making small pieces. Model or mold it into shape with a few free touches. In modeling a form of this kind, if clay has to be removed from the tool, we do not pick it off and place it in the main lump every time, but add it rather to a piece which we keep in the hand. When we need to add more clay, or have to remove it from the model, it can be taken from or added to the lump in the hand. The last step is to trim and square the tile.

Position of Tools.—I have purposely made a number of pictures to show the different positions of holding the tool in modeling and carving. There is no one special hold. The tool is changing from one hand to the other constantly. Experience will give the natural hold. Of course it is

difficult to get the movement from the pictures and the print alone. Seeing it done by an expert is the best way. In teaching, the teacher should go from seat to seat illustrating movement on each tile or slab, if necessary making one leaflet or part of one leaflet occasionally, the pupil looking on and learning.

The Leaf Units.—For the three-pointed leaf form (Illus. 291), make a tile, on the tile draw the leaf with the point of the tool, making the ribs first and then the double curves forming the outline. Practice this a number of times. Make the leaf to fit the tile. Encourage children as much

Illustration 291



A Leaf Tile

as possible to make these quick drawings on the clay, for position, before beginning to model. Next take a piece of clay, and working with both hands, make the leaf form about three-eighths of an inch thick in relief. Make the stem also. Get the entire shape in the rough, with the fingers, in the beginning. Be sure that the clay for the leaf is thoroughly incorporated with the main mass, and that each piece you add is also incorporated with the adjoining surface. See to this in all cases, so that the model will not come apart in drying.

Properly worked together this way, the clay tiles and models should be durable, quite strong and lasting. Unless they are struck or allowed to drop, they can be kept any length of time. It is good to have shelves in the class room on which to place these forms. In most of my schools all the walls are completely covered with the work of the pupils. We do this so that they can get ideas from the work exhibited, and at intervals we allow them to take their productions home and place others in their stead.

Next take the tool and roughly make the depressions on the leaf, first for the midrib and then for the side ribs. Let these touches be bold and free. Then model from the center towards the edge, making the undulations on the leaf. Next make the double curves on each side, beginning with the middle leaflet. Do not finish one part,—work all over the leaf. In shaping the leaflet on one side, do not completely finish it, but make almost

every other touch on the opposite side. In this way you will find that you gradually model balance.

It will help a beginner to look at the pictures of some of the modeled leaves in this book, to see how the texture is produced and also how the carved leaves are made. Do not put in very fine detail in the beginning. In making the serrations on the leaf, model each leaflet separately, first on one side and then on the other. Hold the tool in both hands in doing most of this work. Very rarely is the tool held by one hand alone, it is nearly always guided by the other hand. The same is true of the chisel in carving. This form can be varied, a five-pointed leaf can be made in the same way and quite a number of other shapes can be based on it.

Illustration 292



The Moresque Unit

The Moresque Form is quite difficult, although it looks so simple in outline. In making this, first spend some time in drawing it. It is a little difficult to make this form fit the tile. Do not make it too small, let it be about the proportion of Illus. 292. Take a piece of clay, fill in the surface of

the form piece by piece with the fingers until it is about three-eighths of an inch in height. Allow the form to be a little larger than the one you intend to make. Try to keep the double curve on the large blade showing clearly, letting it taper to a fine point. With very little practice you will find that you can get good forms with the fingers alone. With the fingers the clay can be thoroughly incorporated and made into a solid piece. Now take the tool, and, beginning with the stem, make a single plane from one end to the other with a sweeping touch. I want you to draw this double curve repeatedly on the soft clay, compressing and flattening it at the same time. Repetition will in time compel accuracy, until the hand is able to make these swinging lines quite automatically.

Next we will make the other plane, allowing the modeled line to show a beautiful double curve, the modeled line being the raised edge in the middle of the form. Swing over this curve a number of times, then try the curve on the inside or short blade, swinging around from one end to the other repeatedly. Next on the outside edge. As soon as these planes are satis-

factory, then with a single touch cut out the form, beginning with the large double curve, then making the other side of the blade, and lastly the short curve. This is one of the most difficult forms to get properly and still one of the most satisfactory to make when practice gives facility. The entire form should be made with a few strokes when dexterity has been acquired. Do not make finicky touches. Allow the tool to swing from one end of the unit to the other each time, holding it in both hands and pushing away the surplus clay or adding on, as is needed, from a piece in the hand. Feel the form with the tool and draw it out. Next clean up the background and see that the stem is narrow. Much attention must be given to the raised edge, the modeled line; for although when the model is flat on the table this does not show very plainly, it is the most important line on the model, and when it is in position standing up, it shows more distinctly than any other.

The Scroll and Crocket.—Make the drawing of the complete scroll first (Illus. 293), allow it to fill the tile, and then add the crockets, one to each corner. Make this form repeatedly till it fits the tile. At first it will be a little too small and seem a little crowded. Give five or ten minutes to the drawing. Then take a piece of clay, roll it out about the size of the little finger and place on the drawing, incorporating the clay piece by piece till the entire scroll is covered about three-eighths of an inch thick. Make the form a little thicker than it is intended to be. Now add on the crockets, forming the curve and the tip with the fingers. Let every member of the class block in the entire form with the fingers before using the tool. Then take the tool and place the plane or curves on the surface from the tip of the crocket, gradually merging them with the curves of the scroll. Notice that finally the concave curve of the crocket must meet the convex outer curve of the scroll; and the convex curve of the crocket, the concave line of the scroll. Pass the tool repeatedly up and down till a nice curve is made all around the scroll, curving out each tip at the right place, pushing away the surplus clay with the tool, and adding it

Illustration 293



Scroll and Crocket

to the main lump in the hand. The curve around the center boss is difficult to produce in the beginning, but with practice it can be done with a few touches. Then make the curve inside the scroll. This can be very much curved or almost flat. At first it would be better to make it a little flat. Try to swing this from one end to the other with as few touches and with a movement as continuous as possible.

Next cut out the form down to the tile with the tip of the tool, drawing the shape of the form repeatedly and removing the surplus clay. The pupil must be very attentive in doing this work, otherwise the scroll can be spoiled very quickly. The crockets make the form much harder to model, owing to the curve being interrupted, but with a little practice crockets can

Illustrations 294-296



Plaster Models for Drawing, Modeling and Carving

be thrown out in any direction without any trouble. Later on the double-curving crocket and other forms can be introduced on the scroll in the same way.

Combination of Scrolls and Leaflets. —To make two scrolls in clay flowing one from the other, is good practice. A leaf tip can be modeled coming out of the center. To make this form fit the tile, and to curve the scrolls gradually, one from the other, with single sweeps of the tool, is capital manual training. Combinations of different forms can then be attempted, and balanced designs made for various purposes.

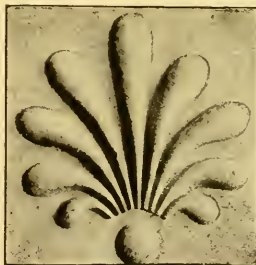
The Anthemion is perhaps the most difficult of all the elementary forms and takes the most time in the beginning. (Illus. 298.) Make a full-sized tile. Make the drawing a number of times first, endeavoring to get the form to fit it. Roll out the lobes in the hand, beginning with the center lobe. Numerous lobes can be made as illustrated in Book Two, Chapter IV. Be sure that they taper to a fine point, and as they grow slim towards the base let them also grow less high in relief. Bend the side lobes so that they curve and balance nicely. Make the lobes match. This is a little difficult at first. Try to get a good curve to each one; show the gradation in the form. Try to feel with the fingers the magnitude of each lobe.

Begin tooling with the center lobe, push away the surplus clay, and make it taper to a fine point. It is difficult to prevent the stems or pipes of the lobes from running into one another. Beginners cannot help this at first. To keep all these stems gradually curving in to the center and to get them to diminish gradually requires a great deal of skill. Do not expect fine results in the beginning. Hold the tool firmly with both hands

Illustrations 297-298



Scroll and Leaflet



Anthemion in Clay

and model each lobe from side to side. The widest part of the lobe will be the thickest. The form must be blocked out roughly in the beginning with a few large touches to get the approximate bulk, and then it must be modeled over again several times, each time getting a finer finish.

Do not expect good results the first time.* Any one making this form can realize what excellent discipline it gives in attaining dexterity and physical co-ordinations. Do not allow the children to turn the tile, keep it in one position throughout the entire lesson. Of course if I were to move it from one side to the other and to keep my hands in the same position all the time in making each lobe, it would be much easier to model. But remember, the object of the lesson is to get the skill that is given to the hands when they become able to move with facility all over the complex form. Pay particular attention to the stems, clean the spaces between the lobes, cut the tile true. This form is much used in carving, modeling, and drawing, and it is one of the best of all the units of design for its union of beauty, balance, proportion, grace, etc.

Illustrations 299-301



Various Arrangements of the Anthemion

The Curved Leaf.—(Illus. 302.) First, make this fit the tile. Make the drawing a number of times. Do not make it too small; allow it to fill the tile. Block in the form with the fingers, as described in making the other forms; be sure to keep the effect of the double curves. Allow the leaf to be nearly half an inch thick in the thickest part, while the back of the leaf tapers down to the tile. Model a large double curve on the back of the leaf first with the tool. Try to make the surface undulate. Keep the double curves of each leaflet true and try to make them with a single touch

*"The repetition of good action generates the habit of doing well, function developing construction, and the habit of doing well generates a moral feeling in regard to said action, which it becomes at last a pain to go against."

of the tool. The spaces between the leaflets should also be made with a single touch of the tool. Get the texture on the surface of the leaflet representing the small ribs, then finish with a narrow stem. To make this leaf with graceful curves, so that it appears to swing nicely, requires practice. Try to prevent a thick and clumsy appearance of the leaf. The tool marks will give very good texture to leaf form. This can be made much more complex, showing more leaflets.

Simple Shell Forms.—The real scalloped shell (page 235) can be conventionalized as desired. Make the drawing, get about the proportion and size, and then add on the clay, making the shell curve up, being sure that it is incorporated on the tile. Repeatedly speak of this to your pupils. It is very uncomfortable to find a shell form like this, for instance, come off the tile, when it dries, especially if a lot of careful work has been placed upon it. Try to get the halves of the shell to balance with the thumbs and forefingers, working at both sides at once. The thumbs are very useful in this work. With a little practice one can make an entire shell form with the fingers and thumbs alone; of course, roughly.

Practice this movement continually. Feel the balance of things. Then you will be able to draw balance. Sculptors often find the thumbs their best tools. We must use the fingers as much as possible, but do not expect to make the sharp edges, the fine detail expected in woodwork, metal work, stone work, and so on, with the thumbs alone. The tool must be used for this. As a person becomes more skilled he will find the fingers more useful, and in making the human figure sometimes the thumbs and parts of the fingers are the main tools used. (See Plate Eighteen, page 235.) Use the tool to make the ribs on the shell.

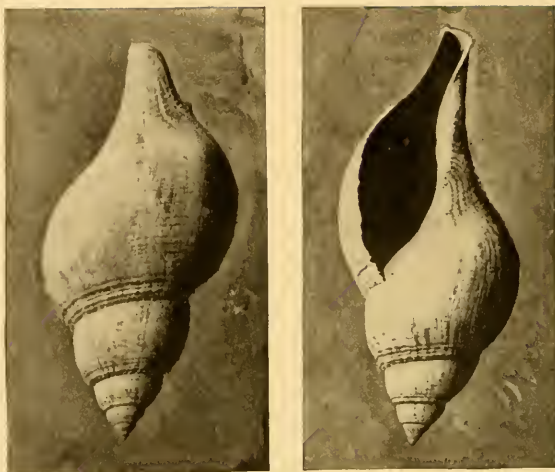
It is very difficult to make these taper. The shell is a wonderful piece of architecture. There are no finer lines or curves in nature than may be found on a good-shaped shell. Try to make the lines all converge and taper gradually. Model on each side. Do not finish one side first and then the other. It is much easier to model both sides, to make all the ribs

Illustration 302



The Curved Leaf

Illustrations 303-304



Real Shells for Models

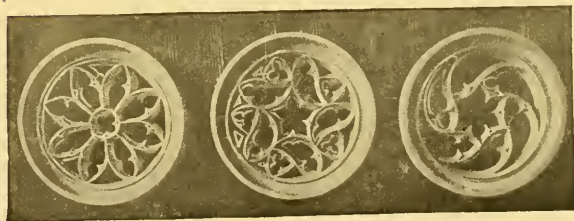
All kinds of shells are suitable to be reproduced in clay. They are cheaply purchased if not otherwise available, and offer endless variety in form, proportion, etc. The accompanying text describes the shell work illustrated on page 235, not the making of these shells in Illustration 303.

and serrations first, in the rough, and then to shape them up and make them still finer. The lines of growth as well as the lines of texture show on a real shell. If you are copying from a real shell endeavor to get these. In some conventional shells and models of shells the lines of growth are left out. The suggestion of a spiral in most shell forms where the lines meet together is very beautiful. Try to make a true spiral instead of a bent line. The last part to model will be the serrations on the edge of the shell. Cut these out with a few simple touches.

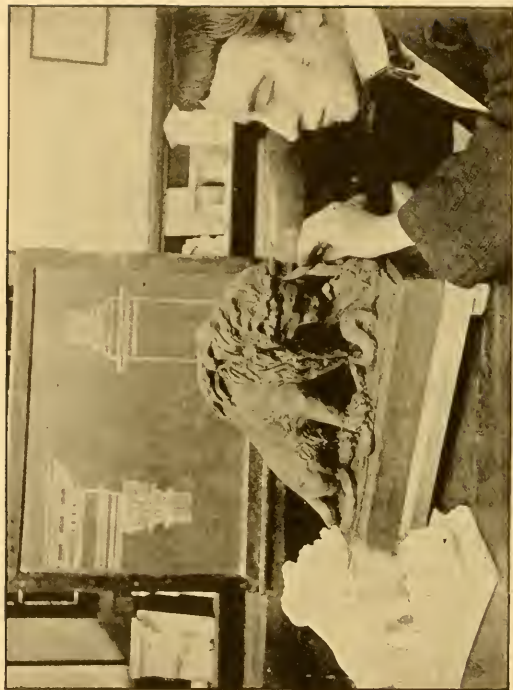
It must be constantly remembered that, at best, word descriptions of how to model are inadequate, compared to the actual doing. The reader who will try modeling, who begins with the elementary work and follows

along into the more difficult forms, will quickly realize the merit of each point advanced in these pages. Experience is the best teacher.

The student will find many suitable forms for modeling suggested in the drawings in Book Two, and the carvings in Book Four. Many of the plaster casts contain also suitable forms. After making a few of the simple units, designs should be made, consisting of some of the units combined in different ways, as illustrated in the picture of tiles on page 231, and on page 189 in first part of book.



Gothic Rosettes Models



Modeling a Lion

This pupil is modeling Lion and Snake, by Barye, from a cast. It is enlarged one-third. The clay model will be fired at a pottery and turns out a fine color. A good terra cotta model of one of the Barye animals is a fine work of art. The clay is fired very hard and is partly vitrified, making a very durable piece of work, showing every tool mark.



Advanced Clay Modeling

These boys are making large original designs and animal forms in clay for architectural purposes. Advanced class, R. C. High School.

CHAPTER VI

Modeling Animal Forms

ANIMAL FORMS.—After the children have modeled several comparatively elaborate tiles and can produce simple forms with good balance, proportion and fitness, they should be allowed to model some of the various animal forms illustrated. Small heads are suitable to begin with. Allow them to make their choice of the sheep, dog, tiger, horse, lion, or other animal. The teacher will find by experience that pupils work with a great deal more energy if they are allowed to work on some form that pleases them. The series of head forms illustrated in 306 has been made for this express purpose. Some of them are quite difficult and some comparatively simple, but if a boy like a horse's head better than a dog's head, although it is much harder to model than the dog's head, he will succeed better with it. So it is with girls. The girls will sometimes select the tiger's head, in preference to the sheep's or the dog's head, although it is much more difficult.

Do not, however, let them attempt the very complex forms till they have made several of these heads. Let each pupil have a separate model, and never allow two or three pupils to copy from one model, if they are seated at tables. The pupils must be able to handle the form all over, whenever desired, or to put it in any position desired, to compare it with their own work. This cannot be done if two or more are working from the same model. Build up the form in the rough first, being sure that the clay is thoroughly incorporated, that it is a solid, well-wedged piece. Do not allow cavities

Illustration 306



Casts of Animal Forms

This set was specially modeled for school purposes, and then duplicated by making plaster casts therefrom. There are about twelve heads in the set; some are pictured on page 181. They form a fine series of models for various classes. For further remarks on these and other plaster models of various forms, see pages 183-184.

to form in the clay. If there are many air spaces in the lump, it is apt to crack in firing, or even in the drying when it is put on the shelf before firing.

I earnestly desire every one reading this book who wishes to get suggestions on the work of modeling, to examine carefully the pictures given of the class rooms. Notice the variety of models around the walls and on

the shelves. All of these pieces of work, except the very white ones, which are plaster casts, have been modeled by the pupils. By studying these plates carefully, ideas can be received as to the best way to work.

Do not allow the pupils to make details in the beginning. Blocking out means to be able to get the large shape roughly first without any detail. This is one of the most difficult things for beginners to do. Nearly always they will begin to make the features before the size of the head is gained. Also try to prevent exaggeration of size. Beginners, especially in making heads, will almost invariably enlarge the size. It takes time to overcome this disposition. If the illustrations accompanying this chapter are carefully studied, you will find by looking at some of the pupils working, that they have produced first the general form in the clay, and on this the careful working for detail is done.

Very little can be said in print on this subject. The model is the best teacher. Till the form is like the model, the pupil can go on working, changing and altering. Allow the pupils to measure if it helps them in the beginning. Rough dimensions can be formed by means of the tool. Usually the plaster models are much smoother than the forms from which they are produced. The plaster casts have been made by pouring the liquid plaster into molds. This, of course, leaves the smooth surface usually seen on plaster casts. The pupils very soon notice the texture of different substances, the texture of wood when it is carved, the texture of metal, the texture of original models in clay. They soon find that it is not always necessary to make the smooth surface of the plaster cast. The required surface varies with the different forms. There is no one kind of modeled surface. On the head forms the tool marks can show, as they do in some of the illustrations. It is far better to show the tool marks all over than to make the form so smooth that it looks like a piece of jelly or pudding. Any good modeler or sculptor will give advice about his work at any time to a student who is unable to work in a school.

For variety, after one or two heads have been made, the pupils can attempt the Barye casts (page 213). These are used in all my schools. They are perhaps the most perfect examples of beautifully modeled animal forms that can be procured. There is a great variety, and all of them seem to interest the children, many pupils being able to duplicate even the most elaborate of them.

Illustration 307



The Real Bird

The Animal Forms.—The pedestal or plinth is usually made first, and then a rough form about the size of the body is put in the required position by a very solid prop under the abdomen. Let this prop be thick and substantial. It does not matter if it fills the whole space under the body, in the beginning. The first day the form can only be very roughly built up, making a kind of core. After the second

day, this clay will be found to be much more solid. It shrinks and hardens so that about the second or third day it is quite substantial,

Modeling from Birds

The panel below is a model in clay from the real bird shown at the left. The panel was made by a pupil of the grammar grade, who had had more training than the pupil that modeled the bird illustrated on page 207, and we therefore have here a better product. This panel is about 16 inches long. The pupil has had only two hours a week in the Public Industrial Art School for drawing, modeling and carving. It must be constantly remembered that these three branches of work are taken in rotation by all pupils. Excellent as is the training afforded by modeling in clay, this training is still better when combined with appropriate exercises in drawing, designing, carving and wood construction.



The Model in Clay

and clay can readily be modeled onto this core, making the form the required size and putting the legs in the required position. Every day the clay will shrink. If a model is to be made of the same size as the original from which it is copied, it must be started a little larger. The shrinkage is about one inch in eight. Remember, the clay shrinks while the form is being made till it is quite dry, and then it shrinks again when it is fired at the pottery and turned into stone. See Plate Thirteen, on page 186.

Do not let the core dry too much. It must be only a little harder than the clay that is added to it. If it is too hard, the clay will shrink unevenly and cracks will result. If the core, or the form in the rough, is moistened too much when it is put away, it is apt to fall down. Nothing but experience will teach the proper manipulation. Of the two states, it is better to keep the clay a little too hard than too soft. As the model approaches completion, it should be allowed to become harder, and the props or supports under the body can be gradually cut away. It is a little difficult to get a large model to shrink evenly all over, but after two or three attempts on forms that are not too difficult, like the animals that are sitting on their hind quarters, it will be found quite easy to model the more complex forms that have a number of supports. If the props are cut away too soon, and before the clay is stiff enough to support its weight, disaster will

Illustrations 308-309



Modeled by Grammar Grade Pupils

result. The remedy, if the forms fall down, is to build them up again with new props, being sure that the broken surfaces have been made wet, so that they will stick together. This frequently happens even to good workers.

For all of the small forms illustrated in our ordinary class work, it is better that the pupils should make their models without any interior supports, that is, without pieces of wood, or of lead pipe, or of iron and wire. We prefer to omit these so that the clay models can be fired at the pottery and the child can keep his original work,—his model when fired showing every tool mark and being very durable and strong. This is much better than to have a cast of the model made, which is done in a great many schools. In our art school over 900 pupils model each winter, and it would be very expensive to cast all their models. The children get a great deal more skill in being able to build up their forms with such solidity. It requires more skill to keep the clay of a regular consistency, so that it will shrink evenly without falling down. Of course, if a plaster cast only is desired, supports can be used inside, or lead pipe can be bent into the required shape. This makes it more easy to model the forms. A plaster cast, however, breaks very readily, chips easily, and, if handled very often, looks quite dirty in a short time. I recommend for school purposes keeping and firing the original models.

Many choice forms suitable for modeling can be found in the pictures of the carving department. All the conventional forms of the different styles make suitable subjects for modeling.

Before dolphins, griffins, grotesques and other complex forms are carved, they should be modeled.

Modeling Natural Forms.—It is only possible in a book of this character to give suggestions for work on a few subjects. As many natural forms as possible should be studied. When I speak fully and at length about shells or fish, it must not be understood that I mean only those forms. Birds, crabs, and animals of various kinds should be studied in the same way. My idea is simply to suggest suitable forms and ways.

Each year we find it feasible to try new subjects before thought not attainable in the school rooms. Shells and fish, butterflies and birds, have been seldom used by large numbers, as they are now used for some of our classes. I find them durable and lasting to a remarkable degree. Stuffed birds in the studio, that have been roughly handled for 18 years by private pupils, are still fit for use. The colors especially seem to be quite permanent.

The fish forms illustrated in Book Two, beginning on page 143, are all used for models in the art schools, with many others. They are mounted on

panels of wood and are very durable. They are used in the modeling room as much as in the drawing room.

Modeling the fish in clay seems to make a very enduring impression upon the mind. The children are really fascinated, for the time being, with

Illustration 310



Modeling Fish Forms

Real mounted fish are used as models. Birds, fish, butterflies, shells, etc., are also kept for general use in the drawing, modeling and carving rooms, as well as casts of various art and nature forms. Conventional forms are also made, embodying fish forms, such as dolphins, grotesques, etc.

the strange and sometimes beautiful forms and colors. The *inspiration* is in the natural forms, as it should be, and the mere contemplation of the forms seems to influence the pupils to action. It is inspiring to the true teacher to

realize the moving force and power of nature. Bring something into the class room like a new bird form, or fish form, and all of the children follow it with their eyes, which seem to almost stick out; there is no lack of attention here, the magnetic influence is at work, the divine energy is flowing. We should flow with it instead of trying to thwart it, as is too often done. This magnetic and energizing power of nature has a splendid influence on the physical, mental and moral development of the young. It also fills the children with interest, imbues them with vigor, inspires them to think and work, while at the same time giving them an appreciation of beauty that adds vastly to the ability of the young to enjoy life.* These are certainly most desirable attributes to develop in youth, for whatever one's vocation may be, the individual should be the better for this training. It is thus distinctly practical, and commends itself to the most materially inclined, as well as satisfying the more ethical aspirations of our nature. "The emotion accompanying every generous act adds an atom to the fabric of the ideal man." By working direct from beautiful natural forms we unite the emotion with the action, and thus still more thoroughly educate.

The tile is first made, as in Illus. 310, and then the fish is built up piece by piece, taking care to keep about the general proportion. Then the tool is used to get the surface and fine curves. When the bulk of the body is about right in proportion, then the spines, fins, eyes, etc., can be added and the details made upon them, the scales usually being the last thing represented. Fish can be readily cast in plaster, and are very easy forms to begin

*"Beauty is not a luxury, as some seem to believe. It is not the exclusive privilege of the few but the common heritage of the many. The rich cannot monopolize it, and persons of taste cannot appropriate it to themselves. There is in every human breast a sense of responsiveness to the beauty of the external world, and the difference is only in the degree to which that sense is developed and cultivated. It is confined to no class, to no age, to no stage of civilization. It is an universal hunger, and its cravings demand satisfaction as urgently in the cabin as on the throne.

"And yet this sense of beauty is too often repressed and crushed instead of being nourished and educated as it deserves. Much happiness is thus lost out of life, for the sense of beauty, wisely administered to, is a well-spring of pleasure. It is even more than this. It is a fountain of life itself. It adds to its fullness and energy, its refinement and delicacy, its sweetness and purity. The life from which it is ungraciously pushed out grows inevitably harder and rougher, coarser and colder, and its influence over other minds deteriorates in the same way.

"How shall this sense of beauty be saved and educated, for rich and poor, for old and young? One way is by contact with its presence. Another and still surer means of cultivating the sense of beauty among us is to accustom ourselves to create it in daily life. This is a part of education and of self-culture that is sadly neglected.

"Then there is the beauty of truth and of character. Perhaps we dwell too much upon the dry and stern aspect of duty and forget to exhibit or to admire the beauty of goodness. But as fast as duty, instead of a sacrifice, becomes a desire, and the love of righteousness becomes the ruling motive, does the character become noble, admirable and beautiful. So all beauty is bound together and leads up from the smallest things of life to the greatest; from the most material to the most spiritual; from the simplest and humblest to the most exalted."—[Anonymous.]

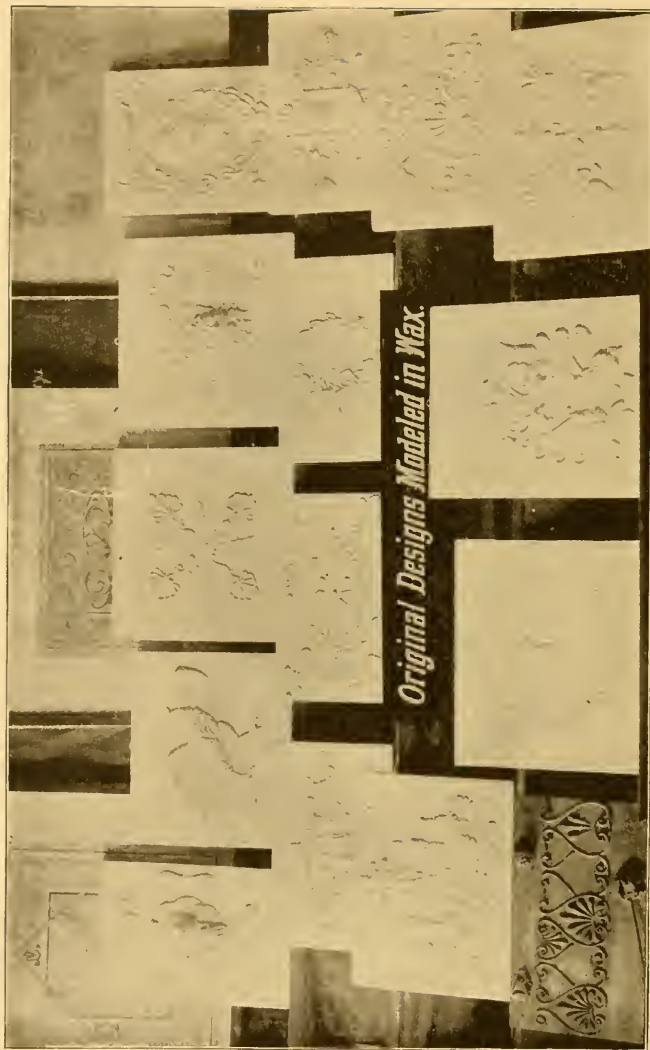
upon in doing plaster casting. The forms are comparatively simple and can be removed from the mold without difficulty.

This work of modeling looks simple, and it is easy when you know how. That is to be learned by actually modeling, rather than by reading about it. The suggestions given in these pages will help, but you must do the work to realize its educational power. The more you model, the more facility and accuracy you will obtain, and the more you will be fascinated with this mode of thought expression.



Griffin, Original Design

Modeled by a R. C. high school boy, for architectural use.



These designs have been cast in plaster from models made in wax by the pupils of the Public School of Industrial Art (grammar grade). The panel on the left, darker in color than the rest, represents a wax model partly finished.



Original Design Modeled in Wax
The design is afterwards cast in plaster and the wax used again.

CHAPTER VII

Wax Modeling

THE DESIGNS SHOWN IN THE PLATE on the opposite page are modeled in wax, and were made by grammar grade pupils.

They are either their original patterns or heads, antique forms and bird forms which they have copied. For convenience, boards 8x14 inches are used to model on, as illustrated above. The pupil first makes a drawing or sketch in chalk on the board. When this is satisfactory it is then lined in with the pencil.

The wax is much stiffer than ordinary clay. It is sometimes also quite sticky and not so pleasant to use as clay. We use it simply because it can be kept an indefinite time, and very fine complex pieces of work requiring a long period of time can be kept from month to month on shelves without their having to be moistened, as is the case with clay. Unless the clay models are wet at frequent intervals they dry up and crack and are of course spoiled. With the wax a piece of work can be labored upon for months if necessary. Real modeling wax is worth about \$1 a pound, the best kind. There are several very good substitutes, however, on the market under several names, which are quite as good for general use. Composition clay is used frequently, costing about 30 cents a pound. The

same tools are used as in clay modeling, and if the wax is a little sticky it is advisable to have a cup of water to moisten the tools and fingers occasionally.

Wood of a little roughness in texture is the best to model upon. Wax must be rubbed into the surface so that it will stick firmly. On this sur-

Illustration 313



Original Panel in Wax

The form is modeled in an upright position by being clamped to a board. The same form with different lighting is shown opposite. By viewing the model with the light and shade changed it can be improved. It is important to get good light and shade.

face the form can be built up into the desired shape, planing off with the tool and forming it as described in the clay modeling. Wax is used for modeling very fine forms to be cast in metal and other materials. Medals and coins are usually modeled in wax. Very fine and beautiful work can be made with small tools. A common slate with a wooden rim is a useful surface to model upon.

It is advisable to allow some of the advanced pupils in each class at intervals to work in wax. For general purposes, however, it is not so good as clay. Do not

allow pupils to make very fine work all the time. Let them occasionally make a large, bold piece for contrast. Wax can be purchased in a number of colors,—bronze-green, brown, red, gray. For general purposes gray is best. Bronze-green is very suitable for figure work, having somewhat the appearance of a bronze when finished.

Wax or composition clay is also more portable than common clay and has been used with success in several of my summer schools. Models of animals, figures, designs, can be boxed and carried with safety when modeled in wax, when a clay model would be broken. The clay when dry is very brittle, and any sudden jar or shock will break large and heavy work unless.

it is fired. For this reason wax is a good substitute. When the wax has been used many times and becomes discolored or dirty, it may be cleaned by melting it.

The plate or designs made by grammar grade children, page 256, has been taken from casts made from the wax models and then the wax is used

Illustration 314



Modeling a Dolphin in Wax

The form can be rapidly changed and improved when viewed in a different light. Use the fingers and thumb as a tool, as illustrated in the above picture, as much as possible. Fine curves and swinging lines can be made this way.

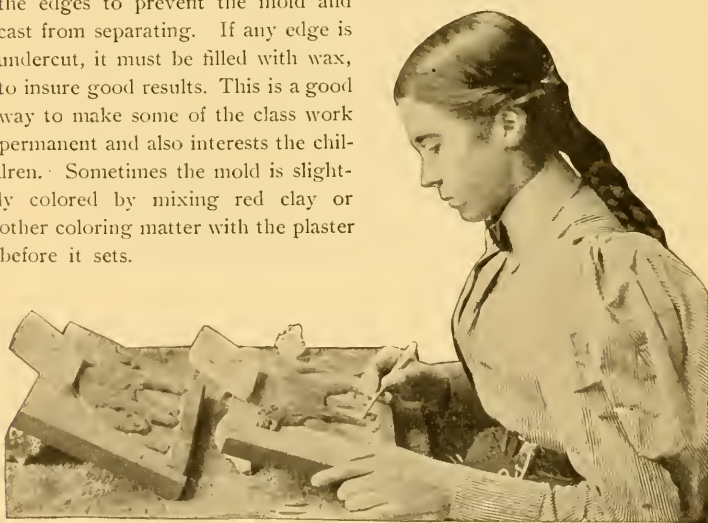
over again many times. Simple designs of this character can be readily cast by the pupils or teacher in the following manner :

When the wax pattern is finished, build a wall of clay around the edge of the design about one inch high. This wall, or fence, of clay, must entirely inclose the design with desired margin. Next take a tin vessel and put in enough water to more than fill the inclosed space. In this water sprinkle the dry plaster with a large iron spoon, stirring it slowly until about the consistency of thin cream. When in this state, pour over the wax model, taking

care to see that the liquid fills all the pattern and space without any large bubbles; this will soon set and harden, and should be about one inch thick. The clay rim can then be removed, the plaster tile lifted from the board, and it will be found to retain the form of the wax model. When the plaster mold is hard, the wax can be pulled out, leaving the exact shape of the model reversed in the plaster. This is the mold.

From this mold another cast may be made that will repeat the form of the wax model. To do this, a clay wall must be built around the mold, and the surface and all parts of the impression upon it must be brushed with sweet oil; this prevents the new plaster, when poured in, from sticking to the mold. The liquid plaster can now be poured in. When it is hard the cast can be separated from the mold by tapping it gently or inserting a blunt knife as a lever. If successfully done, the cast should be a complete copy of the wax model.

Of course this can only be done with flat forms that do not project on the edges to prevent the mold and cast from separating. If any edge is undercut, it must be filled with wax, to insure good results. This is a good way to make some of the class work permanent and also interests the children. Sometimes the mold is slightly colored by mixing red clay or other coloring matter with the plaster before it sets.



Enlarging Animal Forms

These low relief forms are modeled in wax from small casts.

BOOK FOUR

Wood Carving



"The hand, destined to become the instrument for perfecting the other senses, and for developing the endowments of the mind itself, is, in the infant, absolutely powerless."—"The Hand," Sir Charles Bell, K. G. II., F. R. S.

"Awkwardness of limb and inability to use the fingers deftly, continually entail small disasters and occasionally great ones; while expertness frequently comes in aid of welfare, either of self or others. One who has been well practiced in the use of his senses and his muscles, is less likely than the unpracticed to meet with accidents; and when accidents occur, is sure to be more efficient in rectifying mischiefs. Were it not that the obvious truth is ignored, it would be absurd to point out that, since limbs and senses exist to the end of adjusting the actions to surrounding objects and movements, it is the business of everyone to gain skill in the performance of such actions."—[Spencer, Principles of Ethics, page 515.]





Partial View of Wood Carving Room, Public School of Industrial Art, Philadelphia

The pupils, whether of the grammar grades or teachers' classes, rotate into this room from their work in drawing, designing and modeling. By this means, one comparatively small room suffices for 800 pupils in rotation at different hours, 40 working at a time. This picture also emphasizes the simplicity and cheapness of equipment.



Designed and Carved by High School Pupil

CHAPTER I

Tools for Wood Carving Design in Wood*

WOOD CARVING is one of the most beautiful of arts. It requires a real knowledge of form, therefore its educational value lies in enabling pupils to receive fixed or permanent impressions. Just as pupils acquire dexterity and skill in drawing on blackboard or paper, and just as they gain similar dexterity and skill in soft clay, so I wish them also to obtain dexterity in tough wood.

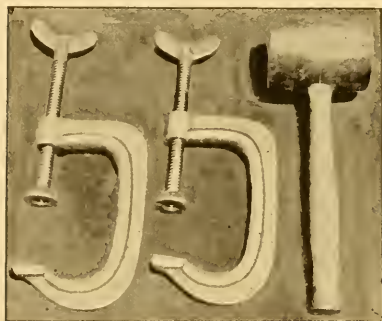
The tools required in carving are very simple. A few gouges and chisels and a mallet, with clamps to hold the work on the table or bench, will be enough. In wood carving, as in carving in marble or other stone, few tools are needed; the fewer the tools used, the better the workman. A

*The carvings and similar work illustrated in this chapter are all done by the children of the various grades.

mallet and a few chisels are the only tools used in sculptured work, and as far back as we can trace in history the tools appear to have been similar in shape. On the back of the Venus of Milo rough tool marks may be seen that indicate to us the kind of edge and size of chisel used in that period of the greatest Greek art.

The Tools.—In carving, the simpler the chisels and the fewer in number that are used the better the result.

Illustration 316



Clamps and Mallet for Wood Carving

Some carvers have rows of 50, 60 or 70 different chisels, but these are usually not very good carvers. Again some of the finest carvers will do all their work in wood, even the most intricate and most elaborate sculpture work, with perhaps no more than half a dozen. My sets for ordinary school purposes usually consist of about 10 tools. It is far better to become thoroughly familiar with all the

capacities of a few tools than to handle a great variety.

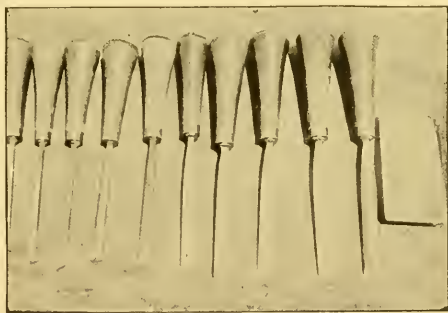
Age at Which to Learn.—As soon as children are big enough to swing their elbows freely above the table or bench, they are ready for carving. Carving is work; not hard work, but work that compels the exercise of a certain amount of energy. Some women are deterred from carving because they think it is hard, and requires the exercise of main strength continually. This is not so. Like marble carving, wood carving is re-enforced by the use of the mallet. If the chisel or gouge cannot be readily pushed through the wood, the mallet is used, and any one who has strength enough to drive a tack can cut the hardest wood. Children of eight or nine, therefore, unless they are constitutionally defective or very weak, are quite large enough and strong enough to carve, and usually enter into it with a great deal of energy and joy. It is fun to them to see the chips fly, and they find it especially attractive when they discover that from the beginning they can make fit and beautiful forms,—rather than the amateurish

things used in some schools, where the children spend their energies on feeble imitative constructions in wood.

Just as our children from the beginning are fit to draw forms of the best style, embodying beauty and grace; and just as in modeling they can make fine forms of the best periods, so in wood we find it to be of advantage that they should from the beginning do the best class of work possible, and become familiar with the forms best suited for this material. It does not follow that because a mind is young, it is less bright and clear in perceiving beautiful and true things. It is just as wrong to give children feeble, aimless forms to model and carve because they are young, as it is to utter baby talk to them when we wish them to speak clearly and to enunciate properly.

The Wood to Use.—Do not let the pupils use soft wood at first,—such as pine or poplar.* This advice, it is true, is opposed to the

Illustration 317



Set of Carving Tools

Including small sharpening stone. With this simple and inexpensive set of tools all ordinary carving can be done.

usual practice in schools. Usually the pupils are allowed to chip blocks of soft pine or poplar. This is a mistake. From the very beginning our pupils, as can be seen by the illustrations, make in hard wood panels fit to be utilized. My reason for using hard wood is that the children from the first

may get accustomed to the texture in ordinary use; most carving being done in oak and mahogany, cherry and walnut, while only occasionally are soft woods employed. The best and the cheapest wood for school purposes is oak. It is a little tough in texture, and offers just enough resistance to prevent it splintering and cutting too freely. If you give a beginner a piece of very soft wood, it splinters so readily that when attacked without skill, the forms are soon spoiled. With a piece of hard wood, on the contrary, a great deal of cutting can be done without splintering the work. Of course it requires more labor, but the product is better,—and there is not so much disappointment. The grain being of firm consistency, it does not give way in unexpected places, as it so often does in the soft wood.

Designing the Form to Carve.—The pupils should from the start make a design that will be of use and value. The first panel can embody the forms that have been given in the modeling. It is not necessary to carve a series of panels, each of which has a separate unit on it. The units may be combined from the beginning, and a panel that will have some value and that can be used for some purpose is the result. In every article printed about carving heretofore, pupils are recommended to practice cutting on soft blocks of wood first, apparently just to get exercise. They are advised to use tracing paper to transfer drawings to the wood; sometimes carbon paper is recommended; at other times tracing cloth, or they are taught to use a pattern wheel,—this is a wheel with little spurs on it that prick the outlines through the pattern into the wood. Some even advise the making of stencils, the forms being cut out in stiff paper in order that the pupil may draw around the edges, and so produce the designs. These are very erroneous bits of advice, and such methods must be avoided by the carver who does not wish to be a feeble amateur.

Let the pupil take a piece of chalk and draw freehand a simple pattern,—say the scroll doubled. Reserve a simple band around the edge of the panel about half or three-quarters of an inch in width. Practice making this drawing till the scrolls balance and fit the space. It is a little difficult to draw freely on rough wood, but with practice it can be done readily. Add a few crockets if desired, each added form making the carving a little more complex. As soon as the form is satisfactorily placed, then with a soft lead pencil—one with a thick lead preferred—make the outline permanent, drawing the line heavily, so that it will not rub off. Any good teacher will

see the absurdity of advising children to trace or to paste on the wood or to produce by artificial means a pattern that ought to be produced automatically by the hand of the pupil. It is because from the very beginning we compel our pupils, on all various surfaces and in the different mediums,

Illustration 318



Positions of Hands in Carving

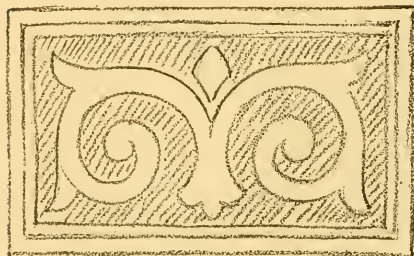
This picture represents four hands gripping tools in various positions. In cutting from right to left the left hand will usually be guiding the tool and also resting on the work to prevent the tool from going too far.

to make the work freehand, that we get the results we do—uniting hand dexterity with originality of product. I have in one school alone 900 pupils carving, and have never had two patterns made exactly alike since the school started. This drawing on the wood, in the beginning with the

chalk and then with the lead pencil, gives very good practice. It requires only a few minutes to do it, and makes the children feel in the beginning that the work is their own. It is very wrong to allow pupils to cheat; and it is really a sort of deception when they are allowed to claim as their own work that which has been copied or traced.

The background can now be scored with the pencil all over. (Illus. 319.) This prevents the pupil from cutting out the ornament instead of the back-

Illustration 319



Background Marked Over for Cutting Out

ground,—a mistake which will frequently occur unless proper precaution is taken. It is only by repeated experience that pupils begin to grasp the idea of form on flat surface. Very few can see a background all over and distinguish it readily from a pattern on the background, unless they have had practice in making these forms. Even adults will frequently cut out part of a pattern by mis-

take, and do this several times before they get accustomed to distinguish the difference. It saves trouble, therefore, to score the background in every case with beginners. Then very little work is spoiled.

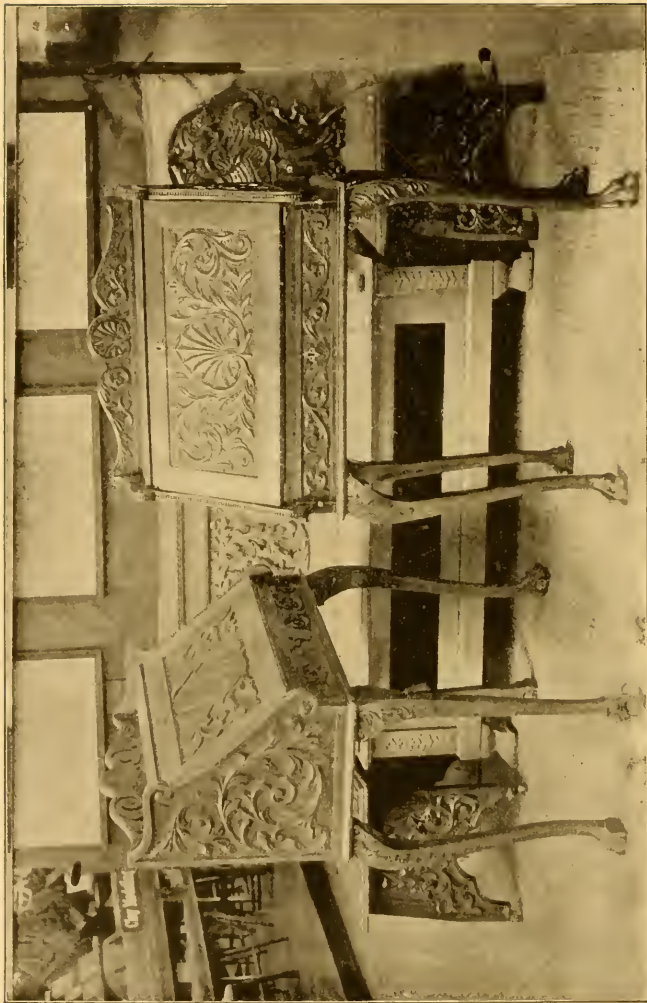
As to Graded Work.—Illustrations are given herewith of graded panels showing the different elements of design separately cut and exhibiting the different stages. These are made simply to illustrate the steps in carving,—a first, a second, and a third stage. They must be carefully studied in advance, and then it will be easier to make the first attempt. In our schools the children see all these operations going on at once, on the different panels. They soon take in the idea, and we find in consequence that it is not essential for each one to make the different units separately, but they can begin on panels.

A number of pictures of panels with graded exercises have also been prepared for those who like to “systematize things.” These forms, however, are mainly useful for pupils who have never had any practice in draw-

ing and modeling. All the pupils in my schools receive the drawing and the modeling from the beginning, in rotation with wood carving, this rendering it unnecessary for them to make the elementary forms. Usually a pupil who can draw a good scroll, and who has modeled the same, can begin to produce it with the chisel in the first lesson.

Illustration 320

**A Picture Frame Designed and Carved by Grammar Grade Pupil**



Examples of Wood Carving

This illustration is from work exhibited at the Philadelphia Bourse, 1877. The two desks have been carved by grammar grade pupils. The settee and chairs are carved by public school teachers, pupils of the Public School of Industrial Art.



Carved by Grammar Grade Pupils

CHAPTER II

Instructions for Elementary Carving

HOW TO CARVE.—Take a gouge, and without removing the lead-pencil marks from the panel, gouge a channel around the design. Grasp the tool firmly in both hands. There is no one position for holding the chisel (see Illus. Nos 322 to 326), but in doing this work, the chisel should change from one hand to the other, as we work from right to left or the reverse, sometimes one hand guiding the chisel and sometimes the other, but most of the time both hands grasping it tightly and helping to guide it.

Cutting tough oak is splendid discipline. Unless the tool is held firmly, it is likely to slip and cut the wrong place. The wood being easy to cut with the grain and hard to cut against the grain, it is difficult at first to make the chisel sweep around a curve, because some part of it will be hard and resist, while the parts of it that go with the grain will be soft. A very few attempts will enable a pupil to find out this characteristic. It is one of the things that we can properly learn only by experience. All the speech in the world and all the talk of a dozen teachers will not enable one to feel these things. If the tool is not very sharp, or if the wood is a little too hard to be cut with a simple pressure of the hands, one hand can hold the chisel and the other drive it, like a mallet, or the mallet even may be used.

It is better, however, in the beginning, to practice as much as possible by pushing the chisel through the wood, so that both hands can get the power to grip the tool tightly, and at the same time to guide it. Do not be too anxious to remove the wood quickly. Endeavor to make free curves from the beginning. It is perhaps better to make slight grooves at first

Illustration 322



Wood Carving

This picture shows method of clamping work to the bench, position of tools and method of grasping tools with both hands. Various pieces of work carved by the boys are in the background.

and then gradually increase them in depth as one's power increases. It will be found very soon that while one hand guides the tool the other will hold it back as much as possible. These movements must be practiced continually till the wood is entirely removed around the whole pattern. The gouge can then be used to remove roughly the rest of the background,

working the chisel as freely as possible and taking care not to cut too deeply into the wood. About one-quarter or three-eighths of an inch is quite enough. Do not attempt to smooth up the background in the beginning.

Other tools can now be taken and the forms can be cut sharp and clean around the edge. This is done by taking a curve that will fit the edge, and cutting it down vertically with a few taps of the mallet. Endeavor to make a continuous clean cut with the tool, fitting successive tools to the altering curve of the outline. Do not let it show irregular marks. Do not try to make a wide curve with a narrow-curved tool. From four to six curves will fit almost any part of a scroll. Where the curve is acute, a chisel of quite an acute curve must be used; where the curve is almost flat, a flatly curved tool is required.

In using the mallet, the pupil from the beginning must get accustomed to holding it in both right and left hand. Do not let the pupils become right-handed, that is, so that they can use the mallet with one hand only. A good carver should be able to work both ways, changing the mallet from hand to hand just as the tool is changed from hand to hand, according to direction. Sometimes the entire background can be cut out this way, using the tool and mallet. It is a matter of choice to the individual. An expert carver will not consider the line or the drawing, but from the beginning will sweep out with a large, deep gouge as much of the background as possible, afterward shaping the different parts of the design. As soon as the whole design stands up clean and well drawn, and as soon as all the background has been removed from every part, the pupil must begin to model the raised part.

Carving the Raised Surface.—This is the most difficult part of the carving, and to be done skillfully requires that the pupils should feel form in the wood with the chisel, just as we feel it in the clay. Select the gouge according to the curve required on the scroll. Next carefully draw a line on the design representing the modeled edge, or the edge that stands up. Then take the gouge and scoop out the inside curve around each scroll to this line. Do a little at a time, gradually letting the chip grow smaller as we come to the end of the sweep. Usually we carve this out about half the depth of the wood, just as we have in the past modeled the form. Practice swinging the chisel in both hands around the curve, making clean, sharp cuts, the pressure being put on the chisel with one hand, while being

guided and held by the other. Most of the time in doing this work one wrist will rest firmly on the work. This support gives a kind of center and leverage that enables one to cut around the curves without much difficulty,

Illustration 323



Wood Carving

Two other positions of holding tools. Variety of carved panels in the background. These boys are carving portions of a very handsome piece of furniture.

each hand helping, one holding back and the other pushing. Curve out as carefully as possible the inside of each scroll.

Then take a chisel that is almost flat and bevel off the outer edge. This is a little more difficult and great care must be taken not to chip or break the modeled edge. The inside curve of each crocket must be scooped out and the outer edge beveled with a nearly flat chisel. Take care of the tips of the crockets. Do not under-cut them so that they chip off. It will not matter if some of the crockets are broken in the beginning. They can be

made smaller, and, if they break again, cut still smaller, or if necessary the design can be rendered without them. Because one crocket is spoiled, do not cut off all the other crockets. Practice on those also. It is very foolish to see some pupils, because they have spoiled or cut off by mistake one crocket, cut off all the others. Practice making each crocket, trying to keep it sharp and to get the curved edge and the bevel edge with facility.

Power in the Hand. —Two or three panels must be carved before one becomes familiar with the grain of the wood. In cutting around a single scroll, the direction of the chisel must usually be changed four times on account of the grain. This seems a little troublesome at the start and puzzles a beginner, but by the time we have cut half a dozen scrolls, the work begins to grow automatic. We no longer have to think about it, and attention can be confined to the shape which we are carving, the hands almost unconsciously having become aware of the texture of the wood in the different positions. This is the power that we wish to get, and pupils must be made to struggle with the wood till they reach this stage. It is an uncomfortable experience to pass through, and the first scroll may take perhaps one, two, or three hours to cut, when later, after facility is gained, it can be done in perhaps fifteen minutes.

Encourage the Pupil. —Remember, the wood is tough and unyielding. The pupils must be encouraged. They must be told what to expect. Unless a pupil can see an expert cut the wood, the experience they receive in the beginning of lack of power is very depressing. But the wood will answer to every touch like plastic wax when once the capacity to carve is acquired. Therefore, again I say, encourage the pupils at this stage. Because occasionally a panel is spoiled, that is no reason why a pupil should be spoiled. The first stages of a carved panel are also very depressing to look at. It is the last few touches, the smoothing touches and the stamping of the background that make the essential difference. Scores of times in my experience I have found that the pupils who are most stupid in the beginning, the ones who make the most awkward attempts, who seem to be all thumbs and despair, are the ones who develop into skilled workers.

Do not, then, because the wood is hard and brittle and notched, and because struggling and strength and reliance are required, let the pupils fail to use these qualities. I consider that our children have learned a most valuable lesson when they become able to make a piece of tough wood

assume the desired beautiful shape. In reaching this stage they have had to exercise their patience, they have had to struggle with both hands and arms; they have had to compel their hands to obey their minds; and to do

Illustration 324



Wood Carving—Position in Malletting

Work of pupils should be displayed around the class rooms, as illustrated.

this, they have had to bring into application a knowledge of form and a care and precision that make them embody these qualities. They must not do all this once or a few times only, but they must form the habit till it becomes automatic.

The Value of Carving.—I regard carving as one of the best means, with modeling, to impress permanently and quickly fundamental forms, fixed concepts of form, in the minds of the children. It is comparatively easy to swing forms of grace and beauty on a blackboard or on a piece of paper. There is very little resistance offered to the hand. But is is a

different matter to swing these things in a tough piece of wood. I want the pupils to be able to look at a flat panel or a rough block of wood and to see its possibilities and potentialities. I want them to be able mentally to see the design in the wood, and with the fewest touches to form this pattern, not by picking it out, as too many often model and carve, bit by bit and chip by chip, but by freely drawing with the tools in the wood. This capacity can be acquired, and all good carvers have it, their work looking very different from that of amateurs.

Use of Finished Work.—It is important for children to see finished pieces of work. In all my class rooms, even in the night schools, we

Illustration 325



Wood Carving

Position when using the hand as a mallet. The hands should swing as freely as possible over the carving.

put all the finished work around the rooms a certain length of time, as may be observed in the illustrations. The pupils thus get ideas. They can see the application of the work, and can follow it in its different stages.

Another plan that I have pursued, is always to allow the children to own their work. It must not be kept by the school altogether, to be used for exhibition purposes, but should always belong to the child. I invariably let them take their pieces home for parents and friends to see; then if necessary they can be brought back and hung up a certain length of time, usually till after the spring exhibition, when all work is carried home by the pupils. Those who are the most discouraged in carving, who find that it is almost impossible to work out the backgrounds and to struggle with the tough wood in the hard places and in the corners, where it is so difficult to remove, are the very ones who need the work the most.

For educational purposes, experience has taught me that a certain proportion of children will dislike drawing on a surface, a certain proportion will dislike clay work, and a certain proportion will dislike carving in wood. Frequently these are the very pupils who do exceptionally well in the other departments. Do not let them for this reason work only in those departments. It is in cases like this that we need the value of the work as discipline. I have never known a pupil, because he liked modeling and disliked carving, to stop work altogether because he was made to carve. He does the carving because it is part of the course, and the modeling because he likes it, or the reverse. After a while all the pupils are intelligent enough to realize the value of each department as training, and are willing to pursue it irrespective of their likes and dislikes.

As a Training.—The bitter must be taken with the sweet. Never allow pupils to elect the branch in which they should work, unless in case of constitutional defect, when exceptions can be made; for instance, when the pupil is a cripple or is physically weak. There is a great disposition among parents, and even among teachers, to let children "do as they will, rather than to make them do as they ought. Moral habits must be formed in children long before you can teach moral principles. In the end the teacher is always justified in the mind of the child when he comes to realize the value of the habit, and later of the principle."* Carving compels attention mentally and visually, in combination with a certain amount of

* Dr. Phillip S. Moxom.

muscular energy that must be exerted, a certain amount of disposition to tug and pull the tough, resisting wood into shape.

Persistent activity that requires the use of a close grip with both hands, and that requires all the muscles of the arm and the thorax to be actively

Illustration 326



One Position of Hand in Gouging

Usually the tools are kept turned in one direction on the bench, with sharpening stone and mallet near to hand.

engaged, is good for the growing children. They are compelled to exert themselves in the very parts of their being that are but little used and are allowed to be torpid most of the time in schools. The chest muscles, the

breathing muscles, the muscles of the arm and the upper part of the body, are all actively exercised in carving. This is doubly valuable to children, because their school work gives them a disposition to lack energy, making them torpid in a measure. I have seen children who are actually too tired through the training they have had, to be willing to grip the handle tight for a continuous period. This is a very bad condition for the pupil to be in, and carving in nearly every case removes it. If a carver has any capacity at all, it will be generally found that he has splendid grip, caused by clutching handles for a certain purpose. We want this capacity in our children, and I believe there is a very firm connection between mental grip and physical grip.

Carving also is unlike sawing and planing, and a good many other operations that merely require the use of strength without much mental effort, since every touch of the chisel in carving must be guided by intelligence. There is no mechanical work about it. The pupil cannot use instruments of precision or other mechanical aid. There is no method by which original carving can be done without the use of the mind.* To prevent cutting too far he must exercise continuously the eye, the hand, and the intelligence, and the hands must continually follow certain forms or lines and those only. That is the reason carving, in combination with drawing and modeling, takes a so much higher rank than all the mechanical methods or the mere teaching of a trade, or those amateur systems of knife-work, where a few feeble constructions are made that have been thought out by the teacher,—repetitions of other people's ideas, and where amateur tools are used.

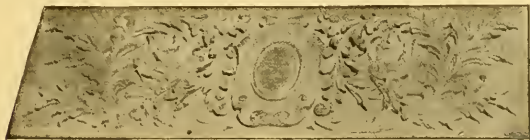
Finishing the Carving.—When the carving has been modeled so far as the pupil can do it, the background can be finished by stamping or left exposed, showing the chisel marks. The former is done by going all over the surface with the point of a stamp, of course using the mallet to apply force. A stamp may be made of a big nail filed on the end to the desired shape. Rough or fine backgrounds can be made as desired. This throws out the design and makes the background even.

Carving and modeling are much superior means of compelling obser-

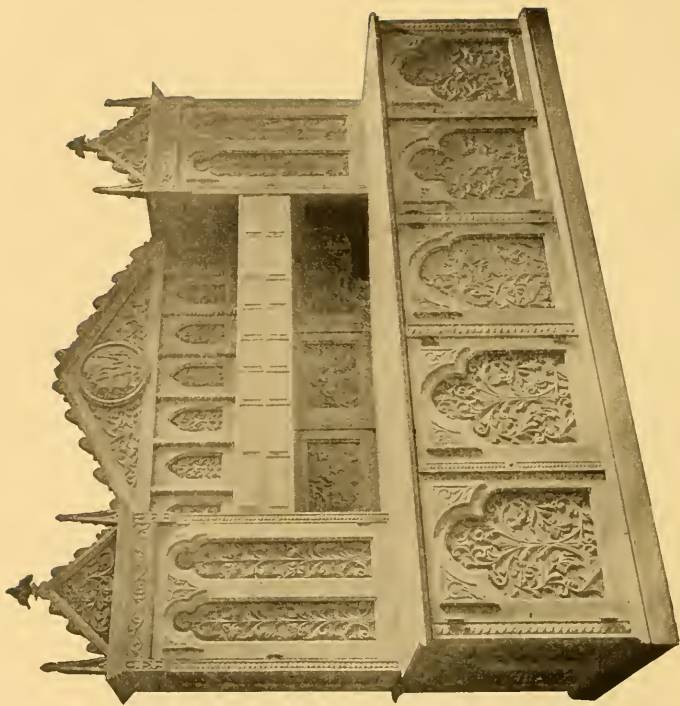
* Machines are now constructed that can copy carving very exactly. But the original piece must first be carved or modeled by the hand and mind.

vation than simple drawing; on account of the forms having been made, they become fixed in the mind permanently, when in drawing or in looking, alone, this is not always the case. After modeling or carving, usually the first time, all the pupils remark the fact that they notice shapes that they have never seen before on the most familiar objects—fences, gratings, buildings, and so on.

It is a fact that not one person in a hundred knows the shape of some of the most familiar forms till they have actually made them. By knowing, I mean, to be able to reconstruct in any way the actual form. They usually have only a partial concept, and the universal peculiarity that is remarked among modelers and carvers is the new way they have come to look at things. They perceive things that they had never noticed before in their environment, and they cannot help but speak of them continually. This is simply nothing more or less than that they are beginning to observe to some purpose for the first time in their lives, and are also beginning to put their powers of observation into practice. They assimilate the differences and resemblances of things that they see and embody them in a work of their own hands and minds. In other words, "they have added another weapon to their arsenal of power."



Carved Panel.



Vestment Case, Carved by Pupils of the R. C. High School



Carved by High School Boy

CHAPTER III

Carving the Elementary Units of Design

IN THIS CHAPTER are given instructions in carving some of the units of design and simple forms used for elementary work in drawing and modeling. In most of my carving classes all the pupils are engaged in making these forms in combination, in designs on panels, etc., to be used for various purposes. For convenience in describing methods, however, the units have been carved to show three stages or steps in the work—(1) the form grooved out, (2) the form nearly finished, (3) quite finished. If these cuts are studied attentively, the work of carving can be readily performed.

The Scroll.—The form is first carefully drawn in chalk until it fits the desired space, then in soft lead pencil to make it show plainly. Then a line is gouged around the form as shown in Illus. 329, being careful not to cut the pattern and to get clean, clear curves. Then the background is partly gouged out. The second step is to cut down around the form to the required depth and then to smooth the background. The raised part can then

be modeled, with a curved surface on the inside of the scroll and a slope on the outside, being careful not to cut more than half-way down to the background.

One can readily see what valuable training is given to the hand and the

Illustration 329



Carving the Scroll

The first part shows the beginning of the work, the form being grooved out; the second partly completed; the third is the finished carving of this simple scroll.

eye, when the pupils can swing these curves freely and in the tough, unyielding wood. What a valuable training it is, in enabling the hand to swing accurate and true forms on paper or surface of any kind.

Illustration 330



Carving the Leaf—Three Stages

The Simple Leaf.—The leaf in this example (Illus. 330) is made about the same in proportion as the leaf used in drill work and for modeling. When the leaf has been carved the form is more vividly remembered and the

magnitude grasped better than through merely drawing and modeling it. To know this simple form accurately is a help in making all other forms.

The form is first drawn in chalk; when the proportions suit, with soft lead pencil. Then gouge the outline and remove background, as illustrated in the first stage. Now sink the background and partly form the surface of the leaf. Third, finish curves and ribs. Every touch with tool will help the student to embody the shape and draw it better.

The Spiral with Crockets.—This form (Illus. 331) is more elaborate and is made in the same way as the spiral. The crockets make it harder to carve, because they interrupt the curves, but with a little practice the forms can be made to flow out with fine tangential curvature. It is difficult, at first, to make the corners free and clean; they will chip off, but a little care will prevent it. The raised edge, or modeled line, is hard to make fine and

Illustration 331



Carving Spiral Crockets—The Three Steps

clean the first few times; it is difficult to prevent it being angular,—gradual transition from curve to curve is necessary. Right here the pupil receives experience in persistence, application, patience, combined with co-operation of hand, eye and mind. All this has an important influence in forming habits of industry and a love for work, as well as its influence manually and mentally.

The Anthemion. (Illus. 332.)—Let this be drawn in chalk, then in pencil. Then (1) remove background, (2) next deepen the background and partly model the various lobes, and (3) then finish the panel. To keep the long narrow parts of the lobes clean and slender is hard, but with practice

all the forms can be nicely modeled with the tools. Use a nearly flat curve for this finishing work, and "feel" the curves with the hand continually. The tool should cut convex curves all over the lobes.

All the various units of form should be carved repeatedly in various designs suitable for use as panels or enrichments for furniture, etc. All the models in the various parts of this work are suitable for carving.

Rosettes are forms frequently required in carving, and to cut some of them in wood gives a wonderful accuracy and fitness. The calipers are used to strike the circle (Illus. 333), and the little boss in the center of the circle. The wood can then be scooped out with the gouge. On this curved surface the leaflets can then be drawn. With a curved chisel cut down the edges, and with a parting tool make the ribs down the center of each leaflet. Remember, the tips stand up and the background curves in quite deep, the entire rosette being below the surface of the piece of wood. The stages can be seen at 333, first a part lead-penciled, then the midrib partly cut, and the leaflets at the back. These forms are simply intended for suggestions, and the actual forms should be studied from examples that can readily be seen in many places. A second form is suggested at *c* in Illus. 333, partly finished and then completely finished. Pursue the same plan in making this form and its variations.

Square Rosettes can also be made (Illus. 334). Mark out the form with ruler, put on the diagonals of the square, make the little circle to represent the boss in the middle of the rosette, and draw the inner square. Next cut around the edge of the leaves with the chisel and sink the middle part of the leaf, then trim out with a nearly flat chisel the points between the leaves; next, sink the background still deeper, and put the finishing touches on with the gouge, as illustrated. In all this work requiring the repetition of similar forms, we allow the use of the ruler and the compass, simply to save time. The actual form is cut with the hand many times, even when the lead-pencil marks have been cut away, so that it is freehand carving, and it is simply for convenience that we space off with the calipers. Of course the spacing also might be done with the aid of the eye alone, but it would never look quite as well. It is only in patterns of this kind, like frets, rosettes and moldings, where there is constant repetition, that we ever use the ruler or the compass. In all other work and designs of different kinds, the eye alone is used.

Illustration 332



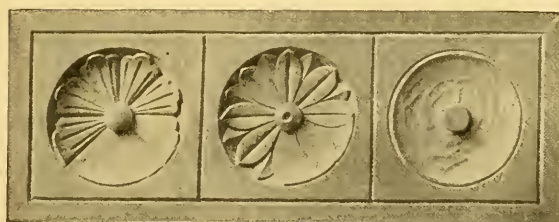
Carving the Anthemion

Illustration 333

c

b

a

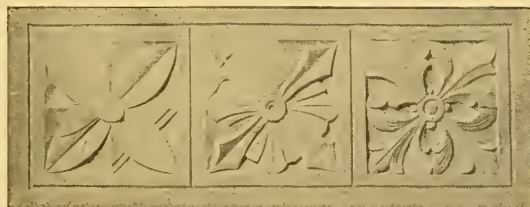


Carving Round Rosettes

Illustration 334

a

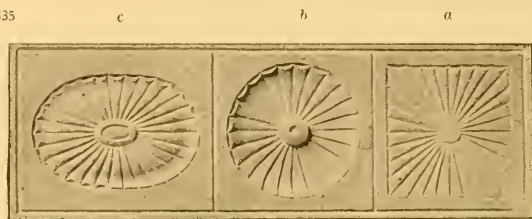
b



Carving Square Rosettes

The next rosette form in the square is a little more difficult, *b*. (Illus. 334.) Place diagonals of the square, as before, make the center boss and then mark out the darts and the scalloped leaf behind the darts. Then with a chisel cut down the outline of the form and remove the background. In making the center of the darts, cut the middle line first quite deep, and then slope down to it with a nearly flat chisel. The curved edges of the form

Illustration 335



Carving Fluted Forms

can then be made and the ribs gouged out. Pupils should be encouraged to make varieties of these rosette forms.

The next rosette is still more complex, and represents a conventional leaf running out to the four corners, *c*, Illus. 334. Draw the form with a soft pencil first, then cut down with a partly curved chisel, remove the background, gouge out the sides of the leaves, as shown in illustration, and round over with a nearly flat tool. The balls can next be modeled and the veins on the leaves gouged out. The background is then finished by stamping.

Fluted Forms are also used for a variety of purposes in carving. (See Illus. 335.) Mark out the surface to be fluted, then the center, then with a parting tool make a set of lines ray out from the center, and curve over with the chisel, lastly making the curved surface at the end of each ray, as in *a*.

The fluted form in a circle (*b*) is more difficult. It is sunk in the wood below the surface, and a concave form must first be made, leaving the center boss standing up. Then make the rays around the circle with the parting tool and curve over. Lastly finish the edges with sharp, clean cuts. The next is a still harder rendering of the same form and the ellipse, with the fluting

making a double curve, as at *c*, Illus. 335. The general form must first be hollowed in the surface, then the form may be drawn with the pencil and made as before. It is excellent discipline to make each one of these curve and diminish gradually. An exceeding amount of patience is required, which is valuable discipline for any one. A steady hand and a true eye are demanded, and if these are properly employed there is a sure return, and a product that is valuable, useful, and beautiful.

Conventionalized Forms for Carving.—The next illustration consists of conventionalized shell forms. 336. These are made the same way as the forms just described. The shape is to be drawn with the pencil, the surface sunk to the desired depth, and then the flutings or lobes are to be carved. Shell forms are among the most beautiful forms that can be made in wood. They seem especially appropriate, and endless is the variety of beautiful results that can be obtained by simply changing the depth and the

Illustration 336



Carvings of Conventionalized Shell Forms

relief of the carving. Sometimes they look very beautiful when scooped in quite deeply, at other times when they are raised up in high relief.

After a few simple forms have been made, like those illustrated, many others are sure to be observed, and fine carved work of different kinds, and the pupil will soon have a desire to make them, and the carving of simple forms will readily enable one to grasp the more complex forms when they are seen. Carving, actually making these shapes in the tough wood, is the best means that I know of for making permanent records of form. This

is the reason that carving is one of the essential branches in this method of training. Many elaborate pieces of carved furniture have been made by the members of the teachers' classes at the art school. They work very faithfully and it is valuable as an offset to their sedentary work at the schools.



Carved by Teacher of the Public Schools



Carving on a Curved Surface

This piece of work, a heavy frame, is clamped in the bench and shows position of hands in carving on the curved surface. The carving is to extend all around the frame.

CHAPTER IV

Carving on Furniture and Other Advanced Work

CARVING IN RELIEF ON CURVED SURFACES.—Pupils must get skill in carving in relief and on curved surfaces, as well as in flat carving. They should make several panels in the flat, however, before attempting work in relief. The borders illustrated herewith (339 to 344 are simple and can be used for a variety of

purposes in the enrichment of furniture, as can be seen by the various illustrations. In making the first strip, which consists of a series of beads of different proportions (Illus. 339), it is necessary to use the calipers,—a pair with a screw preferred. The calipers must be sharply pointed, and by fixing it to the size required, being careful to screw it tightly, the length

Illustration 339



Beaded Surface Border

Illustration 340



Tongue and Dart Molding

of each bead can be accurately marked with the point. As soon as this is done, take a flat chisel and make a slight indentation between each two beads. Enlarge this till it is of the size illustrated, and then with several flat tools, of small size, model each ball or curve. It is quite hard to make them even and equal. If one is cut too small, by accident, do not make the rest so. Go on with the work, making them the proper sizes.

A spoiled one can be cut off and a piece of wood glued on again to be carved. Almost all forms carved in wood can be repaired in this way. It is almost impossible for skilled carvers not to break off occasional pieces. These can be glued on again, or, if lost, another piece of wood can be glued on and then cut to the desired shape. It is very stupid to see a pupil cut off all the elevations or points or crockets, as the case may be, simply because one or two are broken or spoiled in cutting.

The Next Piece of Molding is the tongue and dart, or egg-dart molding, (Illus. 340.) It is seen frequently in wood and stone, and is considered to be one of the best of all moldings. All of these pieces of wood have been shaped by machinery first, and can be purchased, with the desired curve, at almost any mill. It is not necessary for the student to do this preliminary work; it would simply be a waste of time. This design is also to be marked out with the calipers in the beginning, being sure to get the ovals or tongues equal in size, and to make them of such size that the required number will fill the space. This must be done by marking or measuring off the entire surface first. As soon as it is spaced out with the calipers, take a soft pencil and draw the outline of the raised edges. Next take a parting tool and form the outline of the tongue and the darts. (See cut.) The next step is to deepen this, as illustrated, then to make the curve on the tongue and to form the two slopes, making the dart. The background can next be cleaned out and the further depression made on the dart. This work requires considerable care and accurate cutting to make the darts look even, and is very good discipline. It is best not quite to finish several forms,—simply to block them out and then go over them again when the hand is more accustomed to the form.

The next molding is made on a single curved piece, and contains the dart and double curves, producing a more elaborate form. (Illus. 341.)

Illustration 341



Plain Curved Molding

This must be marked out with the calipers, picking out all the points and distances, after which the forms should be drawn with a soft pencil. The midrib can next be marked out with the parting tool and the double curve made with a small gouge. A larger gouge can then be used and the form modeled over to the groove with a nearly flat chisel. Next work out the

dart, keeping a sharp edge down the center and making the corners sharp and clean.

Another Easy Molding requiring great care, however, can be made on the same curve, as illustrated in No. 342. This is to be spaced off with the calipers, after which the form can be drawn with the soft pencil. Use a small gouge to start the outline of the curved forms, and the straight chisel or a parting tool to start the darts. The form can then be fin-

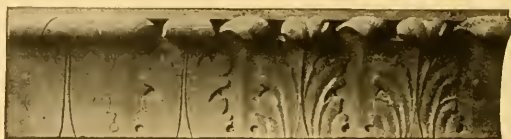
Illustration 342



Plain Curved Molding

ished as illustrated. The next two forms (343 and 344) are complex, making use of the acanthus leaf curling over at the top. This yields a very beautiful series of forms for elaborate work. Mark out carefully with the calipers the size or space to be occupied by each leaf, then draw each leaf carefully with a soft pencil, as illustrated in the first stage. The form can

Illustration 343



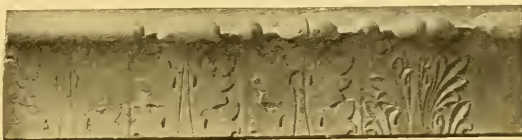
Acanthus Leaf Molding

then be cut in with a curved chisel, using the parting tool to make the rib up the center of each leaf. Next, lower the surface between each two leaves, the rib of the partly seen leaf to remain raised. Then the pipes and undulations on the leaflets can be modeled with different-sized gouges

and flat curves. The top of the leaf can also be cut down and modeled over, allowing the molding to show behind each leaf. It will be found quite difficult to get the edge to run straight. The spaces between the leaves at the top must be made rather deep. The four stages are well shown in the accompanying cut (344).

Another style, on the same kind of molding, is shown in the next illustration. Some find this a little harder and some find it easier to make than the other one. It is to be done in the same way, marking out with the calipers, as before, the space to be occupied by each leaflet, then cutting down with the curved chisel the edge of the leaflet, as shown in the illustration, then sinking the part around the leaf, allowing the partly seen leaf to stand up in the middle. The surface is modeled by making the ridges and forming two sloping surfaces running to the end of each leaflet. It is a little difficult to make all these pipes equal in the beginning. All of

Illustration 344



Acanthus Leaf Molding

this work should be cut in oak at first. This wood is a little tough and is not so liable to chip as walnut, cherry or mahogany. Disaster is sure to happen in a few places at first, but when the leaflet has been carved a number of times, it can be done with ease.

The Next Piece of Carving illustrated is elaborate, and should not be attempted unless the pupil has modeled the form in clay a number of times. The shell form is one that is frequently used in carving, and, with the leaf, forms a nice shape to be used for many purposes, for instance, on a cornice, on a chair back or part of a settee, on picture frames, and so on.

It is best not to copy these very elaborate forms from the illustrations. This would prove a little too difficult. They are simply placed here as

examples of carving. Students will see carving of all kinds when their eyes become opened through the work, and good examples may be seen in wood, stone and metal on different buildings, which can be reproduced. It is only by frequent observation that pupils become aware of form and ac-

Illustration 345



Partly Carved Piece, Suitable for Chair Back

tually notice shape. Every time a different piece of work is carved, the student will have increased ability to perceive various forms.

Forms Suitable for Carving.—Illustrations 346 and 347 show a variety of frames that can be made of different sizes for many different purposes. Made with narrow borders they are very suitable for water colors

Illustrations 346-347

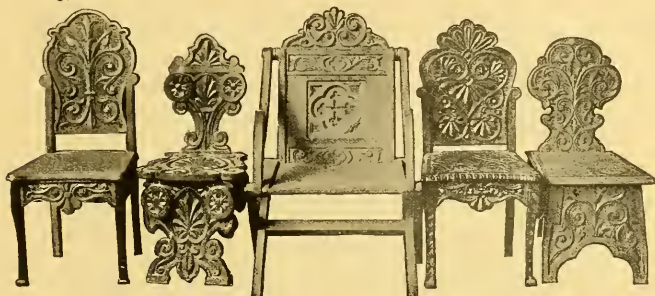


Frames Carved by Night School Pupils

and engravings; made much heavier and of thicker wood they are suitable for oil colors and mirrors; made still larger, and with metal hat pins, they are suitable for hat racks, and are convenient pieces of furniture to have in different parts of the house.

The series of chairs illustrated show a variety of shapes. (Illus. 348.) Some of them may appear to be overloaded with carving. This is simply a matter of economy, and though I know the forms in some cases will be better if they were not carved so much, it is simply to provide surfaces for work that they were made originally. Some of these chairs consist of five pieces, each piece of which is heavily carved, thus affording the pupils several hours of work on each. The blanks for the chairs vary in price, some \$3 to \$5, according to the amount of labor expended upon them. The chairs are usually delivered in the white and doweled together, so that they

Illustration 348

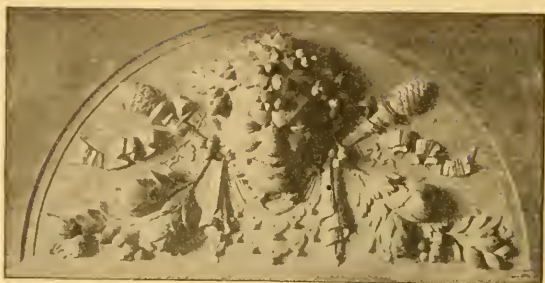


Chairs Designed and Carved by Public School Pupils

can be taken apart with a few taps of the mallet and carved. Two or three chairs will thus furnish occupation for a whole class for a number of periods.

The designs are in no two cases alike. This will be found true with regard to every pattern in any material made by any of our classes, each child according to its capacity creating the forms most suited for use. I do not pretend to defend all the patterns. In some cases they are crude and could be made much better, but being the work that the child sometimes started before the teachers could modify or criticise, it has been finished and must stand on its merits. It is very easy for a good teacher to give good lessons in designing and construction, using as examples the good patterns or the bad ones made by the class. Examples of poor work therefore teach by

Illustrations 349-350



Male



Female

Italian Renaissance Carving by Farari, in the Studio of the Author

contrast. No class of people perceive errors and faults in designing and construction quicker than children. Usually they will be found to select the best. There is an endless variety of forms that afford practice for work in wood. Chests of various sizes can be made with six, eight, ten or twelve panels. Settees also give opportunity for large pieces of work and can be carved liberally all over. A variety of small work can be made, like book-racks, mirror-backs, screens, cabinets, closets, hanging shelves. Clock cases, half size and full length, are in demand and usually find a ready sale. Carving is work especially appropriate for children, for the reason that they are embodying value in the material upon which they work. This

they realize from the beginning. They are also learning the value of persistent hard work, and they get a certain amount of knowledge of art forms and real drawing that cannot be acquired in any other way. Their taste and appreciation of common things around them is enlarged, and the works of their hands usually enter into a great many places where taste and appreciation are lacking, and thus act as missionaries. This is especially true of the night schools.

I am much surprised to notice the small number of schools among all the art institutions of the country where carving is thoroughly taught. It

Illustration 351-354



1—The Plain Block



2—The Form Begun



3—Carving More Advanced



4—The Finished Work

Carving a Cupid's Head

is taught in some, but in the larger number it is entirely neglected. Making form in tough, resisting material is one of the truest and best methods of

gaining permanent and organic ideas of form. Surely this is especially important to the art workers in the higher fields of art. It certainly was a part of the education of some of the greatest of the old masters, who frequently carved in stone and other materials. The energy and diligence begotten by carving, where it is properly taught, are also of the utmost value in counteracting the disinclination to manual effort that occurs so often in children whose school hours are largely occupied with book studies. This fostering of an energetic disposition, along with true ideas of elementary art, is by no means the least important benefit of wood carving and real manual training. Most of us have got to work for a living, and education should give us energy for work instead of a disinclination for it. Not only this, but carving compels accuracy, attention to details, the doing of things well, in contradistinction to the carelessness in the work of one's hands which is sometimes begotten in children who learn from books alone. The carver, whether self-taught or learning from an instructor, will quickly see that slovenly work will show, that the carving will reflect something of his own character. The pupil will also recognize the difference between the result when he tries to do his best, or when he is careless. The wood will tell the truth, always an important lesson.

Carving in the Round. —In this part only a suggestion of what can be done is possible. In another volume I shall give detailed instruction in all kinds of wood carving, with many examples of all the styles. Very beautiful examples of wood carving still exist, made by artists of different periods. Wood of different kinds, especially the Italian chestnut, is suitable for sculptor's work, and very elaborate work may be seen in Italy of groups of figures, etc. Examples of fine modern Italian carving are given in Illus. 349 and 350, made by Farari.

The series of four cuts on the previous page show the successive stages in blocking out a Cupid's head with wings: 1, the plain block made of several pieces of wood glued together; 2, the same partly carved with form in the rough; 3, the head and wings showing distinctly, but still unfinished; 4, the work as it appears finished.

Two examples are given of winged griffins suitable for the arms of settees (Illus. 355-356). The first is shown partly carved, with the form only just beginning to show the intention. The block of wood is three inches thick and is a piece of mahogany. It is clamped on the benches, as shown

in some of the other pictures of pupils working, and is being made by one of the advanced pupils of studio classes. The second form shows a similar piece of work of different design entirely finished. The body consists of one block of wood, the wing being an addition after the other part has been carved. Work of this character cannot be done unless the pupils have a vivid memory of form and have had good manual training.

Dolphins are frequently carved in wood, and the following example (Illus. 357) is frequently cut by some of the pupils. The form is changed and modified to suit any purpose, and is comparatively easy to cut. Both sides are carved, and it makes a suitable arm for chair or hall bench.

A great variety of forms, such as iron and brass castings, or gas fixtures, grills and other ornamental objects, are first carved in wood and then used as patterns for making the castings. Several examples are given of forms of this kind, also architectural detail for interior work, such as caps, pilasters, panels, rosettes, etc.

Illustration 355



Arm for Settee

This illustrates the block of wood partly carved, with the head wings, etc., in the rough. The form is carved on both sides.

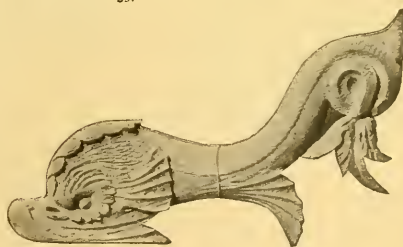
Illustration 356



Another Arm for Settee

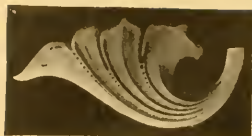
This is another form of similar character completely finished.

Illustration 357



Dolphin Arm for Chair

Illustrations 358-365



Carved Patterns for Metal

These designs are carved in wood for various purposes, to be cast in metal. Many patterns for brass work, gas and electric light fixtures, etc., are carved in wood first.







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